



TETRA TECH NUS

PHIL-21872

**TO:** RUSS TURNER **DATE:** FEBRUARY 17, 2008

**FROM:** MEGAN N. RITCHIE **COPIES:** FILE

**SUBJECT:** INORGANIC DATA VALIDATION – METALS  
NAS JRB WILLOW GROVE SSA 12, WILLOW GROVE, PENNSYLVANIA  
SDG NO. 14410

**SAMPLES:** 20/Solid/

SSA12-FD-01	SSA12-SB10D-2.02.5	SSA12-SS04D-000.5	SSA12-SS10D-000.5
SSA12-SB03D-1.52.0	SSA12-SS01E-000.5	SSA12-SS05E-000.5	SSA12-SS16E-000.5
SSA12-SB04D-2.02.5	SSA12-SS02E-000.5	SSA12-SS06E-000.5	SSA12-SS17E-000.5
SSA12-SB07D-2.02.5	SSA12-SS03D-000.5	SSA12-SS07D-000.5	SSA12-SS18E-000.5
SSA12-SB08D-2.02.5	SSA12-SS03E-000.5	SSA12-SS08D-000.5	SSA12-SS19E-000.5

## OVERVIEW

The sample set for the NAS JRB Willow Grove Site Screening Area (SSA) 12 – Willow Grove, PA, SDG 14410 consists of 20 solid environmental samples (designated SSA12-). One matrix spike sample (SSA12-SS06E-000.5) was designated for this sample set. One field duplicate pair (SSA12-SS16E-000.5 and SSA12-FD-01) was included in this sample set. All samples were analyzed for target analyte list (TAL) metals including mercury.

The samples were collected by Tetra Tech NUS on December 5 and 6, 2007 and analyzed by CompuChem of Cary, North Carolina.

EPA SW-846 Methods were conducted using 6010B for ICP-AES metals and 7471A for mercury.

## SUMMARY

Most analytes were successfully analyzed in all samples. The findings offered in this report are based upon a general review of all available data including data completeness, holding times until analysis, calibration data, laboratory blank results, ICP interference check samples, matrix spike (MS) and matrix spike duplicate (MSD) results, laboratory control spike (LCS) results, field duplicate results, ICP serial dilution results, detection limits, and analyte quantitation.

Areas of concern with respect to data quality are listed below as follows:

## MAJOR PROBLEMS

- Cadmium and silver exhibited negative concentrations with absolute values greater than the MDL in ICS solution A, which indicates the potential for negative bias to an extent that depends on the sample mineral concentrations. For non-detected cadmium and silver results, when the MDL was less than the absolute value of the predicted magnitude of negative interference, such results were qualified as unusable (UR).
- Antimony, sodium, and thallium exhibited positive concentrations with values greater than the MDL in ICS solution A, which indicates the potential for positive bias to an extent that depends on the sample

mineral concentrations. For detected antimony, sodium, and thallium results, when the reported positive result was less than the absolute value of the predicted magnitude of positive interference, such results were qualified as unusable (R).

## MINOR PROBLEMS

- The following table summarizes the analytes detected as contaminants in the laboratory blanks at the maximum concentration indicated:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action Level</u>
Aluminum	57.6 ug/L	28.8 mg/kg
Antimony	0.613 mg/kg	3.065 mg/kg
Beryllium	0.5 ug/L	0.25 mg/kg
Cadmium	0.6 ug/L	0.3 mg/kg
Calcium	23.187 mg/kg	115.94 mg/kg
Chromium	0.255 mg/kg	1.275 mg/kg
Cobalt	1.6 ug/L	0.8 mg/kg
Iron	2.945 mg/kg	14.725 mg/kg
Magnesium	4.613 mg/kg	23.065 mg/kg
Potassium	3.311 mg/kg	16.55 mg/kg
Selenium	4.8 ug/L	2.4 mg/kg
Sodium	51.69 mg/kg	258.4 mg/kg
Vanadium	0.5 ug/L	0.25 mg/kg
Zinc	0.905 mg/kg	4.525 mg/kg

Samples affected: The action levels apply to all solid environmental samples.

Dilution factors, percent solids, and sample preparation weights were taken into account during application of action levels. Results reported at concentrations within the action level are qualified (B) and are considered to be false positives (artifacts of blank contamination). No action was taken for aluminum, beryllium, calcium, chromium, cobalt, iron, magnesium, potassium, selenium, vanadium, and zinc because the results exceeded the action level or there were no positive results for these analytes.

- Cadmium and silver exhibited negative concentrations with absolute values greater than the MDL in ICS solution A, which indicates the potential for negative bias to an extent that depends on the sample mineral concentrations. For positive cadmium and silver results, when the sample concentration was less than 10 times the absolute value of the expected interference, such results were qualified as biased low (L) except where superseded by the qualifier (J) for other quality control (QC) problems.
- Antimony, beryllium, cobalt, sodium, and thallium exhibited positive concentrations with values greater than the MDL in ICS solution A, which indicates the potential for positive bias to an extent that depends on the sample mineral concentrations. For positive antimony, beryllium, cobalt, sodium, and thallium results, when the sample concentration was less than 10 times the absolute value of the

expected interference, such results were qualified as biased high (K) except where superseded by the qualifier (B) for blank contamination or by the qualifier (J) for other QC problems.

- The CRDL standard recovery exceeded the upper QC limit of 110% for cadmium. Positive cadmium results that were less than 2 times the CRDL were qualified as biased high (K) except where superseded by the qualifier (J) for other QC problems.
- The CRDL standard recovery was lower than the lower QC limit of 90% for potassium, silver, and thallium. Non-detected and detected potassium, silver, and thallium results were qualified as biased low (UL/L) except where superseded by the qualifier for unusable non-detected results (UR).
- The MS/MSD recoveries for manganese and mercury exceeded the upper QC limit of 125%. All positive results for these analytes were qualified as biased high (K).
- The MS/MSD recoveries for antimony and selenium were below the lower QC limit of 75%. All positive and non-detected results for these analytes were qualified as biased low (L/UL), except where superseded by the qualifier (UJ), the qualifier (B), or by the qualifier (R) for other QC problems.
- The LCS recovery for antimony was below the lower QC limit of 80%. The positive antimony results were qualified as biased low (L) except where superseded by the qualifier (J), the qualifier (B), and the qualifier (R) for other QC problems.
- The LCS recovery for mercury was above the upper QC limit of 120%. The positive mercury results were qualified as biased high (K).
- The ICP Serial Dilution percent difference (%D) exceeded the QC limit of 10% for copper. The positive copper results were qualified as estimated (J).

#### NOTES

Rinsate blanks associated with the data in this SDG (14410) were included in a separate SDG (14411). Positive results in the rinsate blanks were less than the positive results in the laboratory blanks, therefore, no action was taken.

A dilution was required for iron in sample SSA12-SB08D-2.02.5 because the original analysis concentration for iron was over the linear range of the instrument.

The field duplicate pair (SSA12-SS16E-000.5 and SSA12-FD-01) exhibited duplicate precision within QC criteria.

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## EXECUTIVE SUMMARY

**Laboratory Performance:** Seven analytes displayed signals with absolute values greater than the IDL in the ICP Interference Check Sample A. These analytes may have produced bias in sample analyses. Several analytes were present in the laboratory blanks. Four analytes were outside QC limits for the CRDL standard recovery. The antimony recovery was below the lower QC limit for the LCS.

**Other Factors Affecting Data Quality:** Four MS/MSD recoveries were outside QC criteria. The selenium MSD RPD exceeded QC criteria. The serial dilution for copper exceeded the %D criteria.

The data for these analyses were reviewed with reference to the Tetra Tech NUS Standard Operating Procedure DV-04 (8/01) "Data Validation for Non-CLP Inorganics for Solid and Aqueous Matrices" and EPA "Functional Guidelines for Inorganic Data Review", as amended for use within EPA Region 3 (4/93).

The text of this report has been formatted to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the Functional Guidelines and the Quality Assurance Project Plan (QAPP)."

Megan N. Ritchie

Megan N. Ritchie  
Chemist

Russ Sloboda

Tetra Tech NUS, Inc.  
Russ Sloboda  
Data Validation Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as Reported by the Laboratory
3. Appendix C - Support Documentation

## **APPENDIX A**

### **Qualified Analytical Results**

**PROJ\_NO:** 2192

SDG: 14410 MEDIA: SOIL DATA FRACTION: M

nsample	SSA12-FD-01
samp_date	12/5/2007
lab_id	1441015
qc_type	NM
units	MG/KG
Pct_Solids	80.3
DUP_OF:	SSA12-SS16E-000.5

nsample	SSA12-SB03D-1.5-2.0
samp_date	12/5/2007
lab_id	1441014
qc_type	NM
units	MG/KG
Pct_Solids	80.7
DUP_OF:	

nsample	SSA12-SB04D-2.0-2.5
samp_date	12/5/2007
lab_id	1441012
qc_type	NM
units	MG/KG
Pct_Solids	82.7
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	7840		
ANTIMONY	0.57	B	A
ARSENIC	6.5		
BARIUM	100		
BERYLLIUM	0.66	K	K
CADMIUM	0.61	J	CK
CALCIUM	1830		
CHROMIUM	11.2		
COBALT	5	K	K
COPPER	28.6	J	I
IRON	13500		
LEAD	71.6		
MAGNESIUM	1270		
MANGANESE	317	K	D
MERCURY	0.11	K	DE
NICKEL	8.9		
POTASSIUM	1340		
SELENIUM	0.4	UL	D
SILVER	4.5		
SODIUM	112	B	A
THALLIUM	2.2	K	K
VANADIUM	16.6		
ZINC	106		

Parameter	Result	Val Qual	Qual Code
ALUMINUM	15100		
ANTIMONY	0.71	B	A
ARSENIC	5.2		
BARIUM	84.1		
BERYLLIUM	0.81	K	K
CADMIUM	0.68	J	CK
CALCIUM	1090		
CHROMIUM	18.6		
COBALT	8.6	K	K
COPPER	16.4	J	I
IRON	19600		
LEAD	23.3		
MAGNESIUM	1460		
MANGANESE	502	K	D
MERCURY	0.072	K	DE
NICKEL	17.5		
POTASSIUM	699	L	C
SELENIUM	0.41	UL	D
SILVER	0.06	UR	K
SODIUM	119	B	A
THALLIUM	3.3	K	K
VANADIUM	27.4		
ZINC	139		

Parameter	Result	Val Qual	Qual Code
ALUMINUM	13900		
ANTIMONY	0.48	B	A
ARSENIC	6.2		
BARIUM	49.1		
BERYLLIUM	0.71	K	K
CADMIUM	0.06	UR	K
CALCIUM	673		
CHROMIUM	19.9		
COBALT	11	K	K
COPPER	12.5	J	I
IRON	24300		
LEAD	10.3		
MAGNESIUM	1650		
MANGANESE	437	K	D
MERCURY	0.037	K	DE
NICKEL	11.2		
POTASSIUM	661	L	C
SELENIUM	0.4	UL	D
SILVER	0.06	UR	K
SODIUM	126	B	A
THALLIUM	3.8	K	K
VANADIUM	34.5		
ZINC	35.7		

**PROJ\_NO:** 2192

SDG: 14410 MEDIA: SOIL DATA FRACTION: M

nsample	SSA12-SB07D-2.0-2.5
samp_date	12/5/2007
lab_id	1441009
qc_type	NM
units	MG/KG
Pct_Solids	80.4
DUP_OF:	

nsample	SSA12-SB08D-2.0-2.5
samp_date	12/5/2007
lab_id	1441007
qc_type	NM
units	MG/KG
Pct_Solids	77.8
DUP_OF:	

nsample	SSA12-SB10D-2.0-2.5
samp_date	12/5/2007
lab_id	1441005
qc_type	NM
units	MG/KG
Pct_Solids	85.7
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	17900		
ANTIMONY	0.52	B	A
ARSENIC	11.8		
BARIUM	51		
BERYLLIUM	0.7	K	K
CADMUM	0.06	UR	K
CALCIUM	868		
CHROMIUM	26.8		
COBALT	5.1	K	K
COPPER	16.1	J	I
IRON	36900		
LEAD	11.2		
MAGNESIUM	2190		
MANGANESE	185	K	D
MERCURY	0.072	K	DE
NICKEL	10.7		
POTASSIUM	814	L	C
SELENIUM	0.39	UL	D
SILVER	0.06	UR	K
SODIUM	101	B	A
THALLIUM	6.1	K	K
VANADIUM	42		
ZINC	39.8		

Parameter	Result	Val Qual	Qual Code
ALUMINUM	20100		
ANTIMONY	10.4	J	DEK
ARSENIC	13.3		
BARIUM	233		
BERYLLIUM	0.49	K	K
CADMUM	15.7		
CALCIUM	4750		
CHROMIUM	58.8		
COBALT	11	K	K
COPPER	654	J	I
IRON	166000		
LEAD	1250		
MAGNESIUM	2300		
MANGANESE	1020	K	D
MERCURY	0.12	K	DE
NICKEL	115		
POTASSIUM	600	L	C
SELENIUM	0.42	UL	D
SILVER	7		
SODIUM	195	B	A
THALLIUM	41.1	K	K
VANADIUM	29.4		
ZINC	2100		

Parameter	Result	Val Qual	Qual Code
ALUMINUM	18700		
ANTIMONY	0.34	UL	DE
ARSENIC	5.4		
BARIUM	53.6		
BERYLLIUM	0.62	K	K
CADMUM	0.06	UR	K
CALCIUM	765		
CHROMIUM	28.6		
COBALT	4.5	K	K
COPPER	15.1	J	I
IRON	21600		
LEAD	10.9		
MAGNESIUM	2680		
MANGANESE	111	K	D
MERCURY	0.044	K	DE
NICKEL	13		
POTASSIUM	846	L	C
SELENIUM	0.38	UL	D
SILVER	0.06	UR	K
SODIUM	127	B	A
THALLIUM	3.2	K	K
VANADIUM	43		
ZINC	35.5		

PROJ\_NO: 2192

SDG: 14410 MEDIA: SOIL DATA FRACTION: M

nsample SSA12-SS01E-000.5  
samp\_date 12/6/2007  
lab\_id 1441017  
qc\_type NM  
units MG/KG  
Pct\_Solids 83.3  
DUP\_OF:

Parameter	Result	Val Qual	Qual Code
ALUMINUM	9330		
ANTIMONY	0.69	B	A
ARSENIC	2.2		
BARIUM	38.9		
BERYLLIUM	0.38	K	K
CADMIUM	0.06	UR	K
CALCIUM	587		
CHROMIUM	8.8		
COBALT	4	K	K
COPPER	6.8	J	I
IRON	9480		
LEAD	12.9		
MAGNESIUM	925		
MANGANESE	204	K	D
MERCURY	0.026	K	DE
NICKEL	6.2		
POTASSIUM	474	L	C
SELENIUM	0.39	UL	D
SILVER	0.06	UR	K
SODIUM	81.2	B	A
THALLIUM	1.3	J	CK
VANADIUM	14.5		
ZINC	21.6		

nsample SSA12-SS02E-000.5  
samp\_date 12/6/2007  
lab\_id 1441016  
qc\_type NM  
units MG/KG  
Pct\_Solids 71.7  
DUP\_OF:

Parameter	Result	Val Qual	Qual Code
ALUMINUM	12700		
ANTIMONY	0.57	B	A
ARSENIC	5		
BARIUM	70		
BERYLLIUM	0.77		
CADMIUM	0.07	UR	K
CALCIUM	626		
CHROMIUM	13.2		
COBALT	4.3	K	K
COPPER	12.6	J	I
IRON	11300		
LEAD	29.9		
MAGNESIUM	1190		
MANGANESE	419	K	D
MERCURY	0.11	K	DE
NICKEL	9.3		
POTASSIUM	464	L	C
SELENIUM	0.46	UL	D
SILVER	0.07	UR	K
SODIUM	104	B	A
THALLIUM	1.8	J	CK
VANADIUM	22		
ZINC	40.2		

nsample SSA12-SS03D-000.5  
samp\_date 12/5/2007  
lab\_id 1441011  
qc\_type NM  
units MG/KG  
Pct\_Solids 71.5  
DUP\_OF:

Parameter	Result	Val Qual	Qual Code
ALUMINUM	13400		
ANTIMONY	1.1	B	A
ARSENIC	6.3		
BARIUM	142		
BERYLLIUM	0.81	K	K
CADMIUM	5.2	L	K
CALCIUM	1970		
CHROMIUM	21.1		
COBALT	7.7	K	K
COPPER	39.9	J	I
IRON	21200		
LEAD	66		
MAGNESIUM	1750		
MANGANESE	647	K	D
MERCURY	0.13	K	DE
NICKEL	37.4		
POTASSIUM	917	L	C
SELENIUM	0.45	UL	D
SILVER	0.12	L	CK
SODIUM	96.5	B	A
THALLIUM	3.1	K	K
VANADIUM	31.8		
ZINC	466		

**PROJ\_NO:** 2192

SDG: 14410 MEDIA: SOIL DATA FRACTION: M

nsample	SSA12-SS03E-000.5
samp_date	12/6/2007
lab_id	1441018
qc_type	NM
units	MG/KG
Pct_Solids	77.5
DUP_OF:	

nsample	SSA12-SS04D-000.5
samp_date	12/5/2007
lab_id	1441010
qc_type	NM
units	MG/KG
Pct_Solids	71.3
DUP_OF:	

nsample	SSA12-SS05E-000.5
samp_date	12/6/2007
lab_id	1441020
qc_type	NM
units	MG/KG
Pct_Solids	72.7
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	12900		
ANTIMONY	1.2	B	A
ARSENIC	2.8		
BARIUM	57.6		
BERYLLIUM	0.44	K	K
CADMUM	0.06	UR	K
CALCIUM	850		
CHROMIUM	38.5		
COBALT	4.7	K	K
COPPER	15	J	I
IRON	14700		
LEAD	172		
MAGNESIUM	1070		
MANGANESE	329	K	D
MERCURY	0.043	K	DE
NICKEL	8.1		
POTASSIUM	526	L	C
SELENIUM	0.43	UL	D
SILVER	0.06	UR	K
SODIUM	98.3	B	A
THALLIUM	2.5	K	K
VANADIUM	17.5		
ZINC	61.6		

Parameter	Result	Val Qual	Qual Code
ALUMINUM	13700		
ANTIMONY	1.4	B	A
ARSENIC	6.3		
BARIUM	130		
BERYLLIUM	0.86	K	K
CADMUM	9.4		
CALCIUM	1960		
CHROMIUM	27.1		
COBALT	8.9	K	K
COPPER	51.9	J	I
IRON	22100		
LEAD	102		
MAGNESIUM	1840		
MANGANESE	753	K	D
MERCURY	0.18	K	DE
NICKEL	63.5		
POTASSIUM	925	L	C
SELENIUM	0.46	UL	D
SILVER	0.44	L	CK
SODIUM	119	B	A
THALLIUM	3.8	K	K
VANADIUM	32.7		
ZINC	731		

Parameter	Result	Val Qual	Qual Code
ALUMINUM	11200		
ANTIMONY	0.83	B	A
ARSENIC	6.7		
BARIUM	79.6		
BERYLLIUM	0.71	K	K
CADMUM	0.18	B	A
CALCIUM	2050		
CHROMIUM	17.5		
COBALT	5.2	K	K
COPPER	24.6	J	I
IRON	16400		
LEAD	179		
MAGNESIUM	1830		
MANGANESE	306	K	D
MERCURY	0.069	K	DE
NICKEL	11.4		
POTASSIUM	728	L	C
SELENIUM	0.44	UL	D
SILVER	0.07	UR	K
SODIUM	143	B	A
THALLIUM	3	K	K
VANADIUM	25.9		
ZINC	74.8		

PROJ\_NO: 2192

SDG: 14410 MEDIA: SOIL DATA FRACTION: M

nsample SSA12-SS06E-000.5  
samp\_date 12/6/2007  
lab\_id 1441019  
qc\_type NM  
units MG/KG  
Pct\_Solids 77.7  
DUP\_OF:

Parameter	Result	Val Qual	Qual Code
ALUMINUM	16700		
ANTIMONY	0.91	B	A
ARSENIC	5.8		
BARIUM	67		
BERYLLIUM	0.74	K	K
CADMIUM	0.06	UR	K
CALCIUM	780		
CHROMIUM	23.1		
COBALT	5.5	K	K
COPPER	14.4	J	I
IRON	21700		
LEAD	27.4		
MAGNESIUM	2050		
MANGANESE	224	K	D
MERCURY	0.043	K	DE
NICKEL	11.7		
POTASSIUM	667	L	C
SELENIUM	0.42	UL	D
SILVER	0.06	UR	K
SODIUM	226	B	A
THALLIUM	3.6	K	K
VANADIUM	36.6		
ZINC	51.4		

nsample SSA12-SS07D-000.5  
samp\_date 12/5/2007  
lab\_id 1441008  
qc\_type NM  
units MG/KG  
Pct\_Solids 67.6  
DUP\_OF:

Parameter	Result	Val Qual	Qual Code
ALUMINUM	7260		
ANTIMONY	0.8	B	A
ARSENIC	12.8		
BARIUM	59.7		
BERYLLIUM	0.65	K	K
CADMIUM	0.07	UR	K
CALCIUM	1360		
CHROMIUM	11.7		
COBALT	3.9	K	K
COPPER	16.1	J	I
IRON	11900		
LEAD	40.5		
MAGNESIUM	998		
MANGANESE	271	K	D
MERCURY	0.47	K	DE
NICKEL	8.1		
POTASSIUM	537	L	C
SELENIUM	0.49	UL	D
SILVER	0.09	L	CK
SODIUM	108	B	A
THALLIUM	1.5	R	K
VANADIUM	19.5		
ZINC	48.9		

nsample SSA12-SS08D-000.5  
samp\_date 12/5/2007  
lab\_id 1441006  
qc\_type NM  
units MG/KG  
Pct\_Solids 71.5  
DUP\_OF:

Parameter	Result	Val Qual	Qual Code
ALUMINUM	14400		
ANTIMONY	0.93	B	A
ARSENIC	6		
BARIUM	103		
BERYLLIUM	0.9	K	K
CADMIUM	0.09	B	A
CALCIUM	4520		
CHROMIUM	18.9		
COBALT	5.4	K	K
COPPER	24.8	J	I
IRON	19100		
LEAD	66.7		
MAGNESIUM	2740		
MANGANESE	488	K	D
MERCURY	0.24	K	DE
NICKEL	12.7		
POTASSIUM	886	L	C
SELENIUM	0.46	UL	D
SILVER	3.5		
SODIUM	125	B	A
THALLIUM	3.6	K	K
VANADIUM	29.7		
ZINC	133		

PROJ\_NO: 2192

SDG: 14410 MEDIA: SOIL DATA FRACTION: M

nsample SSA12-SS10D-000.5  
samp\_date 12/5/2007  
lab\_id 1441004  
qc\_type NM  
units MG/KG  
Pct\_Solids 73.1  
DUP\_OF:

Parameter	Result	Val Qual	Qual Code
ALUMINUM	13400		
ANTIMONY	1.1	B	A
ARSENIC	5.8		
BARIUM	97		
BERYLLIUM	0.91	K	K
CADMIUM	0.07	UR	K
CALCIUM	1440		
CHROMIUM	15.8		
COBALT	5	K	K
COPPER	21.5	J	I
IRON	14300		
LEAD	37.6		
MAGNESIUM	1500		
MANGANESE	632	K	D
MERCURY	0.17	K	DE
NICKEL	10.9		
POTASSIUM	584	L	C
SELENIUM	0.45	UL	D
SILVER	0.07	UR	K
SODIUM	90.1	B	A
THALLIUM	2.1	K	K
VANADIUM	24.8		
ZINC	241		

nsample SSA12-SS16E-000.5  
samp\_date 12/5/2007  
lab\_id 1441003  
qc\_type NM  
units MG/KG  
Pct\_Solids 75.8  
DUP\_OF:

Parameter	Result	Val Qual	Qual Code
ALUMINUM	7630		
ANTIMONY	0.97	B	A
ARSENIC	8.4		
BARIUM	104		
BERYLLIUM	0.69	K	K
CADMIUM	0.59	J	CK
CALCIUM	1640		
CHROMIUM	12.1		
COBALT	5.3	K	K
COPPER	29.6	J	I
IRON	16000		
LEAD	74.4		
MAGNESIUM	1170		
MANGANESE	324	K	D
MERCURY	0.14	K	DE
NICKEL	9.2		
POTASSIUM	1220		
SELENIUM	0.44	UL	D
SILVER	5.2		
SODIUM	126	B	A
THALLIUM	3	K	K
VANADIUM	18.2		
ZINC	109		

nsample SSA12-SS17E-000.5  
samp\_date 12/5/2007  
lab\_id 1441001  
qc\_type NM  
units MG/KG  
Pct\_Solids 68.4  
DUP\_OF:

Parameter	Result	Val Qual	Qual Code
ALUMINUM	12000		
ANTIMONY	1.1	B	A
ARSENIC	4.7		
BARIUM	98.6		
BERYLLIUM	0.79	K	K
CADMIUM	0.07	UR	K
CALCIUM	4560		
CHROMIUM	16.6		
COBALT	6.1	K	K
COPPER	23.1	J	I
IRON	26600		
LEAD	43.6		
MAGNESIUM	2180		
MANGANESE	405	K	D
MERCURY	0.38	K	DE
NICKEL	13		
POTASSIUM	1400		
SELENIUM	0.48	UL	D
SILVER	0.68	L	CK
SODIUM	184	B	A
THALLIUM	3.8	K	K
VANADIUM	25.1		
ZINC	72.7		

PROJ\_NO: 2192

SDG: 14410 MEDIA: SOIL DATA FRACTION: M

nsample SSA12-SS18E-000.5  
samp\_date 12/5/2007  
lab\_id 1441002  
qc\_type NM  
units MG/KG  
Pct\_Solids 73.8  
DUP\_OF:

Parameter	Result	Val Qual	Qual Code
ALUMINUM	12400		
ANTIMONY	0.62	B	A
ARSENIC	4.1		
BARIUM	66.4		
BERYLLIUM	0.7	K	K
CADMIUM	0.07	UR	K
CALCIUM	1710		
CHROMIUM	18.9		
COBALT	7.8	K	K
COPPER	227	J	I
IRON	20600		
LEAD	29.1		
MAGNESIUM	1920		
MANGANESE	320	K	D
MERCURY	0.056	K	DE
NICKEL	11.6		
POTASSIUM	1130		
SELENIUM	0.45	UL	D
SILVER	0.07	UR	K
SODIUM	122	B	A
THALLIUM	3.3	K	K
VANADIUM	30.6		
ZINC	45.3		

nsample SSA12-SS19E-000.5  
samp\_date 12/5/2007  
lab\_id 1441013  
qc\_type NM  
units MG/KG  
Pct\_Solids 83.0  
DUP\_OF:

Parameter	Result	Val Qual	Qual Code
ALUMINUM	9890		
ANTIMONY	0.77	B	A
ARSENIC	3		
BARIUM	77.9		
BERYLLIUM	0.77	K	K
CADMIUM	0.06	UR	K
CALCIUM	1850		
CHROMIUM	13.3		
COBALT	6.2	K	K
COPPER	12.5	J	I
IRON	13800		
LEAD	27.5		
MAGNESIUM	1510		
MANGANESE	430	K	D
MERCURY	0.054	K	DE
NICKEL	10		
POTASSIUM	1230		
SELENIUM	0.4	UL	D
SILVER	0.06	UR	K
SODIUM	99.6	B	A
THALLIUM	1.8	J	CK
VANADIUM	21		
ZINC	43.1		

**Qualifier Codes:**

- a = Lab Blank Contamination
- b = Field Blank Contamination
- c = Calibration (i.e., %RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
- d = MS/MSD Noncompliance
- e = LSC/LSCD Noncompliance
- f = Laboratory Duplicate Imprecision
- g = Field Duplicate Imprecision
- h = Holding Time Exceedance
- i = ICP Serial Dilution Noncompliance
- j = GFAA PDS – GFAA MSA's  $r < 0.995$  (correlation coefficient)
- k = ICP Interference – include ICSAB %Rs
- l = Instrument Calibration Range Exceedance
- m = Sample Preservation
- n = Internal Standard Noncompliance
- o = Poor Instrument Performance (i.e. baseline drifting)
- p = Uncertainty Near Detection Limit (<2 x IDL for inorganics and < CRQL for organics)
- q = Other Problems (can encompass of number of issues)
- r = Surrogates Recovery Noncompliance
- s = Pesticide/PCB Resolution
- t = % Breakdown Noncompliance for DDT and Endrin
- u = Pesticide/PCB % Difference Between Columns for Positive Results
- v = Non-linear Calibrations, Tuning  $r < 0.995$  (correlation coefficient)

**Data Qualifier Key:**

- B - Positive result is considered to be an artifact of blank contamination and should not be considered present.
- J - Value is considered estimated due to exceedance of technical quality control or because result is less than the Contract Required Quantitation Limit (CRQL).
- K - Positive result is considered biased high due to exceedance of technical quality control criteria.
- L - Positive result is considered biased low due to exceedance of technical quality control criteria.
- R - Value is considered unusable due to exceedance of technical quality control criteria.
- U - Value is a non-detected result as reported by the laboratory.
- UJ - Non-detected result is considered estimated due to exceedances of technical quality control criteria.
- UL - Non-detected result is considered biased low due to exceedance of technical quality control criteria.
- UR - Non-detected result is considered unusable due to exceedances of technical quality control criteria.

## **APPENDIX B**

**Results as Reported by the Laboratory**

## SW846 - METALS

-I-

## INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

SSA12-FD-01

Lab Name: COMPUCHEM

Contract: \_\_\_\_\_

Lab Code: LIBRTY

Case No.: \_\_\_\_\_

SAS No.: \_\_\_\_\_

SDG No.: 14410Matrix (soil/water): SOILLab Sample ID: 1441015Level (low/med): LOWDate Received: 12/6/2007% Solids: 80.3Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7840			P
7440-36-0	Antimony	0.57	B	N	P
7440-38-2	Arsenic	6.5			P
7440-39-3	Barium	100			P
7440-41-7	Beryllium	0.66			P
7440-43-9	Cadmium	0.61			P
7440-70-2	Calcium	1830			P
7440-47-3	Chromium	11.2			P
7440-48-4	Cobalt	5.0			P
7440-50-8	Copper	28.6	E		P
7439-89-6	Iron	13500			P
7439-92-1	Lead	71.6			P
7439-95-4	Magnesium	1270			P
7439-96-5	Manganese	317	N		P
7439-97-6	Mercury	0.11	N		CV
7440-02-0	Nickel	8.9			P
7440-09-7	Potassium	1340			P
7782-49-2	Selenium	0.40	U	N	P
7440-22-4	Silver	4.5			P
7440-23-5	Sodium	112	B		P
7440-28-0	Thallium	2.2			P
7440-62-2	Vanadium	16.6			P
7440-66-6	Zinc	106			P

Color Before: BROWN Clarity Before: \_\_\_\_\_ Texture: MEDIUMColor After: YELLOW Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_Comments: \_\_\_\_\_  
\_\_\_\_\_  
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## SW846 - METALS

-1-

## INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

SB03D-1.52.0

Lab Name: COMPUCHEM

Contract: \_\_\_\_\_

Lab Code: LIBRTY

Case No.: \_\_\_\_\_

SAS No.: \_\_\_\_\_

SDG No.: 14410Matrix (soil/water): SOILLab Sample ID: 1441014Level (low/med): LOWDate Received: 12/6/2007% Solids: 80.7Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	15100			P
7440-36-0	Antimony	0.71	B	N	P
7440-38-2	Arsenic	5.2			P
7440-39-3	Barium	84.1			P
7440-41-7	Beryllium	0.81			P
7440-43-9	Cadmium	0.68			P
7440-70-2	Calcium	1090			P
7440-47-3	Chromium	18.6			P
7440-48-4	Cobalt	8.6			P
7440-50-8	Copper	16.4	E		P
7439-89-6	Iron	19600			P
7439-92-1	Lead	23.3			P
7439-95-4	Magnesium	1460			P
7439-96-5	Manganese	502	N		P
7439-97-6	Mercury	0.072	N		CV
7440-02-0	Nickel	17.5			P
7440-09-7	Potassium	699			P
7782-49-2	Selenium	0.41	U	N	P
7440-22-4	Silver	0.06	U		P
7440-23-5	Sodium	119	B		P
7440-28-0	Thallium	3.3			P
7440-62-2	Vanadium	27.4			P
7440-66-6	Zinc	139			P

Color Before: BROWN Clarity Before: \_\_\_\_\_ Texture: MEDIUMColor After: YELLOW Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_

Comments: \_\_\_\_\_

## SW846 - METALS

-1-

## INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

SB04D-2.02.5

Lab Name: COMPUCHEM

Contract: \_\_\_\_\_

Lab Code: LIBRTY

Case No.: \_\_\_\_\_

SAS No.: \_\_\_\_\_

SDG No.: 14410Matrix (soil/water): SOILLab Sample ID: 1441012Level (low/med): LOWDate Received: 12/6/2007% Solids: 82.7Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	13900			P
7440-36-0	Antimony	0.48	B	N	P
7440-38-2	Arsenic	6.2			P
7440-39-3	Barium	49.1			P
7440-41-7	Beryllium	0.71			P
7440-43-9	Cadmium	0.06	U		P
7440-70-2	Calcium	673			P
7440-47-3	Chromium	19.9			P
7440-48-4	Cobalt	11.0			P
7440-50-8	Copper	12.5	E		P
7439-89-6	Iron	24300			P
7439-92-1	Lead	10.3			P
7439-95-4	Magnesium	1650			P
7439-96-5	Manganese	437	N		P
7439-97-6	Mercury	0.037	B	N	CV
7440-02-0	Nickel	11.2			P
7440-09-7	Potassium	661			P
7782-49-2	Selenium	0.40	U	N	P
7440-22-4	Silver	0.06	U		P
7440-23-5	Sodium	126	B		P
7440-28-0	Thallium	3.8			P
7440-62-2	Vanadium	34.5			P
7440-66-6	Zinc	35.7			P

Color Before: BROWN Clarity Before: \_\_\_\_\_ Texture: MEDIUMColor After: YELLOW Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_

Comments:

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## SW846 - METALS

-1-

## INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

SB07D-2.02.5

Lab Name: COMPUCHEM

Contract: \_\_\_\_\_

Lab Code: LIBRTY

Case No.: \_\_\_\_\_

SAS No.: \_\_\_\_\_

SDG No.: 14410Matrix (soil/water): SOILLab Sample ID: 1441009Level (low/med): LOWDate Received: 12/6/2007% Solids: 80.4Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	17900			P
7440-36-0	Antimony	0.52	B	N	P
7440-38-2	Arsenic	11.8			P
7440-39-3	Barium	51.0			P
7440-41-7	Beryllium	0.70			P
7440-43-9	Cadmium	0.06	U		P
7440-70-2	Calcium	868			P
7440-47-3	Chromium	26.8			P
7440-48-4	Cobalt	5.1			P
7440-50-8	Copper	16.1	E		P
7439-89-6	Iron	36900			P
7439-92-1	Lead	11.2			P
7439-95-4	Magnesium	2190			P
7439-96-5	Manganese	185	N		P
7439-97-6	Mercury	0.072	N		CV
7440-02-0	Nickel	10.7			P
7440-09-7	Potassium	814			P
7782-49-2	Selenium	0.39	U	N	P
7440-22-4	Silver	0.06	U		P
7440-23-5	Sodium	101	B		P
7440-28-0	Thallium	6.1			P
7440-62-2	Vanadium	42.0			P
7440-66-6	Zinc	39.8			P

Color Before: BROWN Clarity Before: \_\_\_\_\_ Texture: MEDIUMColor After: YELLOW Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_Comments: \_\_\_\_\_  
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## SW846 - METALS

-1-

## INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

SB08D-2.02.5

Lab Name: COMPUCHEM

Contract: \_\_\_\_\_

Lab Code: LIBRTY

Case No.: \_\_\_\_\_

SAS No.: \_\_\_\_\_

SDG No.: 14410Matrix (soil/water): SOILLab Sample ID: 1441007Level (low/med): LOWDate Received: 12/6/2007% Solids: 77.8Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	20100			P
7440-36-0	Antimony	10.4	N		P
7440-38-2	Arsenic	13.3			P
7440-39-3	Barium	233			P
7440-41-7	Beryllium	0.49	B		P
7440-43-9	Cadmium	15.7			P
7440-70-2	Calcium	4750			P
7440-47-3	Chromium	58.8			P
7440-48-4	Cobalt	11.0			P
7440-50-8	Copper	654	E		P
7439-89-6	Iron	166000			P
7439-92-1	Lead	1250			P
7439-95-4	Magnesium	2300			P
7439-96-5	Manganese	1020	N		P
7439-97-6	Mercury	0.12	N		CV
7440-02-0	Nickel	115			P
7440-09-7	Potassium	600	B		P
7782-49-2	Selenium	0.42	U	N	P
7440-22-4	Silver	7.0			P
7440-23-5	Sodium	195	B		P
7440-28-0	Thallium	41.1			P
7440-62-2	Vanadium	29.4			P
7440-66-6	Zinc	2100			P

Color Before: BROWN Clarity Before: \_\_\_\_\_ Texture: COARSEColor After: YELLOW Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_Comments: \_\_\_\_\_  
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## SW846 - METALS

-1-

## INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

SB10D-2.02.5

Lab Name: COMPUCHEM

Contract: \_\_\_\_\_

Lab Code: LIBRTY

Case No.: \_\_\_\_\_

SAS No.: \_\_\_\_\_

SDG No.: 14410Matrix (soil/water): SOILLab Sample ID: 1441005Level (low/med): LOWDate Received: 12/6/2007% Solids: 85.7Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	18700			P
7440-36-0	Antimony	0.34	U	N	P
7440-38-2	Arsenic	5.4			P
7440-39-3	Barium	53.6			P
7440-41-7	Beryllium	0.62			P
7440-43-9	Cadmium	0.06	U		P
7440-70-2	Calcium	765			P
7440-47-3	Chromium	28.6			P
7440-48-4	Cobalt	4.5			P
7440-50-8	Copper	15.1	E		P
7439-89-6	Iron	21600			P
7439-92-1	Lead	10.9			P
7439-95-4	Magnesium	2680			P
7439-96-5	Manganese	111	N		P
7439-97-6	Mercury	0.044	N		CV
7440-02-0	Nickel	13.0			P
7440-09-7	Potassium	846			P
7782-49-2	Selenium	0.38	U	N	P
7440-22-4	Silver	0.06	U		P
7440-23-5	Sodium	127	B		P
7440-28-0	Thallium	3.2			P
7440-62-2	Vanadium	43.0			P
7440-66-6	Zinc	35.5			P

Color Before: BROWN Clarity Before: \_\_\_\_\_ Texture: MEDIUMColor After: YELLOW Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_Comments: \_\_\_\_\_  
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## SW846 - METALS

-1-

## INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

SS01E-000.5

Lab Name: COMPUCHEM

Contract: \_\_\_\_\_

Lab Code: LIBERTY

Case No.:

SAS No.:

SDG No.: 14410Matrix (soil/water): SOILLab Sample ID: 1441017Level (low/med): LOWDate Received: 12/7/2007% Solids: 83.3Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	9330			P
7440-36-0	Antimony	0.69	B	N	P
7440-38-2	Arsenic	2.2			P
7440-39-3	Barium	38.9			P
7440-41-7	Beryllium	0.38	B		P
7440-43-9	Cadmium	0.06	U		P
7440-70-2	Calcium	587	B		P
7440-47-3	Chromium	8.8			P
7440-48-4	Cobalt	4.0			P
7440-50-8	Copper	6.8	E		P
7439-89-6	Iron	9480			P
7439-92-1	Lead	12.9			P
7439-95-4	Magnesium	925			P
7439-96-5	Manganese	204	N		P
7439-97-6	Mercury	0.026	B	N	CV
7440-02-0	Nickel	6.2			P
7440-09-7	Potassium	474	B		P
7782-49-2	Selenium	0.39	U	N	P
7440-22-4	Silver	0.06	U		P
7440-23-5	Sodium	81.2	B		P
7440-28-0	Thallium	1.3			P
7440-62-2	Vanadium	14.5			P
7440-66-6	Zinc	21.6			P

Color Before: BROWN Clarity Before: \_\_\_\_\_ Texture: MEDIUMColor After: YELLOW Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_Comments: \_\_\_\_\_  
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## SW846 - METALS

-1-

## INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

SS02E-000.5

Lab Name: COMPUCHEM

Contract: \_\_\_\_\_

Lab Code: LIBRTY

Case No.: \_\_\_\_\_

SAS No.: \_\_\_\_\_

SDG No.: 14410Matrix (soil/water): SOILLab Sample ID: 1441016Level (low/med): LOWDate Received: 12/7/2007% Solids: 71.7Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	12700			P
7440-36-0	Antimony	0.57	B	N	P
7440-38-2	Arsenic	5.0			P
7440-39-3	Barium	70.0			P
7440-41-7	Beryllium	0.77			P
7440-43-9	Cadmium	0.07	U		P
7440-70-2	Calcium	626	B		P
7440-47-3	Chromium	13.2			P
7440-48-4	Cobalt	4.3			P
7440-50-8	Copper	12.6	E		P
7439-89-6	Iron	11300			P
7439-92-1	Lead	29.9			P
7439-95-4	Magnesium	1190			P
7439-96-5	Manganese	419	N		P
7439-97-6	Mercury	0.11	N		CV
7440-02-0	Nickel	9.3			P
7440-09-7	Potassium	464	B		P
7782-49-2	Selenium	0.46	U	N	P
7440-22-4	Silver	0.07	U		P
7440-23-5	Sodium	104	B		P
7440-28-0	Thallium	1.8			P
7440-62-2	Vanadium	22.0			P
7440-66-6	Zinc	40.2			P

Color Before: BROWN Clarity Before: \_\_\_\_\_ Texture: MEDIUMColor After: YELLOW Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_Comments: \_\_\_\_\_  
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## SW846 - METALS

-1-

## INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

SS03D-000.5

Lab Name: COMPUCHEM

Contract: \_\_\_\_\_

Lab Code: LIBRTY

Case No.: \_\_\_\_\_

SAS No.: \_\_\_\_\_

SDG No.: 14410Matrix (soil/water): SOILLab Sample ID: 1441011Level (low/med): LOWDate Received: 12/6/2007% Solids: 71.5Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	13400			P
7440-36-0	Antimony	1.1	B	N	P
7440-38-2	Arsenic	6.3			P
7440-39-3	Barium	142			P
7440-41-7	Beryllium	0.81			P
7440-43-9	Cadmium	5.2			P
7440-70-2	Calcium	1970			P
7440-47-3	Chromium	21.1			P
7440-48-4	Cobalt	7.7			P
7440-50-8	Copper	39.9	E		P
7439-89-6	Iron	21200			P
7439-92-1	Lead	66.0			P
7439-95-4	Magnesium	1750			P
7439-96-5	Manganese	647	N		P
7439-97-6	Mercury	0.13	N		CV
7440-02-0	Nickel	37.4			P
7440-09-7	Potassium	917			P
7782-49-2	Selenium	0.45	U	N	P
7440-22-4	Silver	0.12	B		P
7440-23-5	Sodium	96.5	B		P
7440-28-0	Thallium	3.1			P
7440-62-2	Vanadium	31.8			P
7440-66-6	Zinc	466			P

Color Before: BROWN Clarity Before: \_\_\_\_\_ Texture: MEDIUMColor After: YELLOW Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_Comments: \_\_\_\_\_  
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## SW846 - METALS

-1-

## INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

SS03E-000.5

Lab Name: COMPUCHEM

Contract: \_\_\_\_\_

Lab Code: LIBERTY

Case No.: \_\_\_\_\_

SAS No.: \_\_\_\_\_

SDG No.: 14410Matrix (soil/water): SOILLab Sample ID: 1441018Level (low/med): LOWDate Received: 12/7/2007% Solids: 77.5Concentration Units ( $\mu\text{g/L}$  or  $\text{mg/kg}$  dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	12900			P
7440-36-0	Antimony	1.2	B	N	P
7440-38-2	Arsenic	2.8			P
7440-39-3	Barium	57.6			P
7440-41-7	Beryllium	0.44	B		P
7440-43-9	Cadmium	0.06	U		P
7440-70-2	Calcium	850			P
7440-47-3	Chromium	38.5			P
7440-48-4	Cobalt	4.7			P
7440-50-8	Copper	15.0	E		P
7439-89-6	Iron	14700			P
7439-92-1	Lead	172			P
7439-95-4	Magnesium	1070			P
7439-96-5	Manganese	329	N		P
7439-97-6	Mercury	0.043	N		CV
7440-02-0	Nickel	8.1			P
7440-09-7	Potassium	526	B		P
7782-49-2	Selenium	0.43	U	N	P
7440-22-4	Silver	0.06	U		P
7440-23-5	Sodium	98.3	B		P
7440-28-0	Thallium	2.5			P
7440-62-2	Vanadium	17.5			P
7440-66-6	Zinc	61.6			P

Color Before: BROWN Clarity Before: \_\_\_\_\_ Texture: MEDIUMColor After: YELLOW Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_Comments:  
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## SW846 - METALS

-I-

## INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

SS04D-000.5

Lab Name: COMPUCHEM

Contract: \_\_\_\_\_

Lab Code: LIBRTY

Case No.: \_\_\_\_\_

SAS No.: \_\_\_\_\_

SDG No.: 14410Matrix (soil/water): SOILLab Sample ID: 1441010Level (low/med): LOWDate Received: 12/6/2007% Solids: 71.3Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	13700			P
7440-36-0	Antimony	1.4	B	N	P
7440-38-2	Arsenic	6.3			P
7440-39-3	Barium	130			P
7440-41-7	Beryllium	0.86			P
7440-43-9	Cadmium	9.4			P
7440-70-2	Calcium	1960			P
7440-47-3	Chromium	27.1			P
7440-48-4	Cobalt	8.9			P
7440-50-8	Copper	51.9	E		P
7439-89-6	Iron	22100			P
7439-92-1	Lead	102			P
7439-95-4	Magnesium	1840			P
7439-96-5	Manganese	753	N		P
7439-97-6	Mercury	0.18	N		CV
7440-02-0	Nickel	63.5			P
7440-09-7	Potassium	925			P
7782-49-2	Selenium	0.46	U	N	P
7440-22-4	Silver	0.44	B		P
7440-23-5	Sodium	119	B		P
7440-28-0	Thallium	3.8			P
7440-62-2	Vanadium	32.7			P
7440-66-6	Zinc	731			P

Color Before: BROWN Clarity Before: \_\_\_\_\_ Texture: MEDIUMColor After: YELLOW Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_Comments: \_\_\_\_\_  
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## SW846 - METALS

-1-

## INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

SS05E-000.5

Lab Name: COMPUCHEM

Contract: \_\_\_\_\_

Lab Code: LIBRTY

Case No.: \_\_\_\_\_

SAS No.: \_\_\_\_\_

SDG No.: 14410Matrix (soil/water): SOILLab Sample ID: 1441020Level (low/med): LOWDate Received: 12/7/2007% Solids: 72.7Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	11200			P
7440-36-0	Antimony	0.83	B	N	P
7440-38-2	Arsenic	6.7			P
7440-39-3	Barium	79.6			P
7440-41-7	Beryllium	0.71			P
7440-43-9	Cadmium	0.18	B		P
7440-70-2	Calcium	2050			P
7440-47-3	Chromium	17.5			P
7440-48-4	Cobalt	5.2			P
7440-50-8	Copper	24.6	E		P
7439-89-6	Iron	16400			P
7439-92-1	Lead	179			P
7439-95-4	Magnesium	1830			P
7439-96-5	Manganese	306	N		P
7439-97-6	Mercury	0.069	N		CV
7440-02-0	Nickel	11.4			P
7440-09-7	Potassium	728			P
7782-49-2	Selenium	0.44	U	N	P
7440-22-4	Silver	0.07	U		P
7440-23-5	Sodium	143	B		P
7440-28-0	Thallium	3.0			P
7440-62-2	Vanadium	25.9			P
7440-66-6	Zinc	74.8			P

Color Before: BROWN Clarity Before: \_\_\_\_\_ Texture: MEDIUMColor After: YELLOW Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_Comments: \_\_\_\_\_  
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## SW846 - METALS

-1-

## INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

SS06E-000.5

Lab Name: COMPUCHEM

Contract: \_\_\_\_\_

Lab Code: LIBRTY

Case No.: \_\_\_\_\_

SAS No.: \_\_\_\_\_

SDG No.: 14410Matrix (soil/water): SOILLab Sample ID: 1441019Level (low/med): LOWDate Received: 12/7/2007% Solids: 77.7Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	16700			P
7440-36-0	Antimony	0.91	B	N	P
7440-38-2	Arsenic	5.8			P
7440-39-3	Barium	67.0			P
7440-41-7	Beryllium	0.74			P
7440-43-9	Cadmium	0.06	U		P
7440-70-2	Calcium	780			P
7440-47-3	Chromium	23.1			P
7440-48-4	Cobalt	5.5			P
7440-50-8	Copper	14.4	E		P
7439-89-6	Iron	21700			P
7439-92-1	Lead	27.4			P
7439-95-4	Magnesium	2050			P
7439-96-5	Manganese	224	N		P
7439-97-6	Mercury	0.043	N		CV
7440-02-0	Nickel	11.7			P
7440-09-7	Potassium	667			P
7782-49-2	Selenium	0.42	U	N	P
7440-22-4	Silver	0.06	U		P
7440-23-5	Sodium	226	B		P
7440-28-0	Thallium	3.6			P
7440-62-2	Vanadium	36.6			P
7440-66-6	Zinc	51.4			P

Color Before: BROWN Clarity Before: \_\_\_\_\_ Texture: MEDIUMColor After: YELLOW Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_Comments: \_\_\_\_\_  
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## SW846 - METALS

-1-

## INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

SS07D-000.5

Lab Name: COMPUCHEM

Contract: \_\_\_\_\_

Lab Code: LIBRTY

Case No.:

SAS No.:

SDG No.: 14410Matrix (soil/water): SOILLab Sample ID: 1441008Level (low/med): LOWDate Received: 12/6/2007% Solids: 67.6Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7260			P
7440-36-0	Antimony	0.80	B	N	P
7440-38-2	Arsenic	12.8			P
7440-39-3	Barium	59.7			P
7440-41-7	Beryllium	0.65	B		P
7440-43-9	Cadmium	0.07	U		P
7440-70-2	Calcium	1360			P
7440-47-3	Chromium	11.7			P
7440-48-4	Cobalt	3.9			P
7440-50-8	Copper	16.1	E		P
7439-89-6	Iron	11900			P
7439-92-1	Lead	40.5			P
7439-95-4	Magnesium	998			P
7439-96-5	Manganese	271	N		P
7439-97-6	Mercury	0.47	N		CV
7440-02-0	Nickel	8.1			P
7440-09-7	Potassium	537	B		P
7782-49-2	Selenium	0.49	U	N	P
7440-22-4	Silver	0.09	B		P
7440-23-5	Sodium	108	B		P
7440-28-0	Thallium	1.5			P
7440-62-2	Vanadium	19.5			P
7440-66-6	Zinc	48.9			P

Color Before: BROWN Clarity Before: \_\_\_\_\_ Texture: MEDIUMColor After: YELLOW Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_Comments: \_\_\_\_\_  
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## SW846 - METALS

-1-

## INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

SS08D-000.5

Lab Name: COMPUCHEM

Contract: \_\_\_\_\_

Lab Code: LIBRTY

Case No.: \_\_\_\_\_

SAS No.: \_\_\_\_\_

SDG No.: 14410Matrix (soil/water): SOILLab Sample ID: 1441006Level (low/med): LOWDate Received: 12/6/2007% Solids: 71.5Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	14400			P
7440-36-0	Antimony	0.93	B	N	P
7440-38-2	Arsenic	6.0			P
7440-39-3	Barium	103			P
7440-41-7	Beryllium	0.90			P
7440-43-9	Cadmium	0.09	B		P
7440-70-2	Calcium	4520			P
7440-47-3	Chromium	18.9			P
7440-48-4	Cobalt	5.4			P
7440-50-8	Copper	24.8	E		P
7439-89-6	Iron	19100			P
7439-92-1	Lead	66.7			P
7439-95-4	Magnesium	2740			P
7439-96-5	Manganese	488	N		P
7439-97-6	Mercury	0.24	N		CV
7440-02-0	Nickel	12.7			P
7440-09-7	Potassium	886			P
7782-49-2	Selenium	0.46	U	N	P
7440-22-4	Silver	3.5			P
7440-23-5	Sodium	125	B		P
7440-28-0	Thallium	3.6			P
7440-62-2	Vanadium	29.7			P
7440-66-6	Zinc	133			P

Color Before: BROWN Clarity Before: \_\_\_\_\_ Texture: MEDIUMColor After: YELLOW Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_Comments:  
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## SW846 - METALS

-1-

## INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

SS10D-000.5

Lab Name: COMPUCHEM

Contract: \_\_\_\_\_

Lab Code: LIBRTY

Case No.: \_\_\_\_\_

SAS No.: \_\_\_\_\_

SDG No.: 14410Matrix (soil/water): SOILLab Sample ID: 1441004Level (low/med): LOWDate Received: 12/6/2007% Solids: 73.1Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	13400			P
7440-36-0	Antimony	1.1	B	N	P
7440-38-2	Arsenic	5.8			P
7440-39-3	Barium	97.0			P
7440-41-7	Beryllium	0.91			P
7440-43-9	Cadmium	0.07	U		P
7440-70-2	Calcium	1440			P
7440-47-3	Chromium	15.8			P
7440-48-4	Cobalt	5.0			P
7440-50-8	Copper	21.5	E		P
7439-89-6	Iron	14300			P
7439-92-1	Lead	37.6			P
7439-95-4	Magnesium	1500			P
7439-96-5	Manganese	632	N		P
7439-97-6	Mercury	0.17	N		CV
7440-02-0	Nickel	10.9			P
7440-09-7	Potassium	584	B		P
7782-49-2	Selenium	0.45	U	N	P
7440-22-4	Silver	0.07	U		P
7440-23-5	Sodium	90.1	B		P
7440-28-0	Thallium	2.1			P
7440-62-2	Vanadium	24.8			P
7440-66-6	Zinc	241			P

Color Before: BROWN Clarity Before: \_\_\_\_\_ Texture: MEDIUMColor After: YELLOW Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_Comments: \_\_\_\_\_  
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## SW846 - METALS

-I-

## INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

SS16E-000.5

Lab Name: COMPUCHEM

Contract: \_\_\_\_\_

Lab Code: LIBRTY

Case No.: \_\_\_\_\_

SAS No.: \_\_\_\_\_

SDG No.: 14410Matrix (soil/water): SOILLab Sample ID: 1441003Level (low/med): LOWDate Received: 12/6/2007% Solids: 75.8Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7630			P
7440-36-0	Antimony	0.97	B	N	P
7440-38-2	Arsenic	8.4			P
7440-39-3	Barium	104			P
7440-41-7	Beryllium	0.69			P
7440-43-9	Cadmium	0.59	B		P
7440-70-2	Calcium	1640			P
7440-47-3	Chromium	12.1			P
7440-48-4	Cobalt	5.3			P
7440-50-8	Copper	29.6	E		P
7439-89-6	Iron	16000			P
7439-92-1	Lead	74.4			P
7439-95-4	Magnesium	1170			P
7439-96-5	Manganese	324	N		P
7439-97-6	Mercury	0.14	N		CV
7440-02-0	Nickel	9.2			P
7440-09-7	Potassium	1220			P
7782-49-2	Selenium	0.44	U	N	P
7440-22-4	Silver	5.2			P
7440-23-5	Sodium	126	B		P
7440-28-0	Thallium	3.0			P
7440-62-2	Vanadium	18.2			P
7440-66-6	Zinc	109			P

Color Before: BROWN Clarity Before: \_\_\_\_\_ Texture: MEDIUMColor After: YELLOW Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_Comments:  
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## SW846 - METALS

-1-

## INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

SS17E-000.5

Lab Name: COMPUCHEM

Contract: \_\_\_\_\_

Lab Code: LIBRTY

Case No.: \_\_\_\_\_

SAS No.: \_\_\_\_\_

SDG No.: 14410Matrix (soil/water): SOILLab Sample ID: 1441001Level (low/med): LOWDate Received: 12/6/2007% Solids: 68.4Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	12000			P
7440-36-0	Antimony	1.1	B	N	P
7440-38-2	Arsenic	4.7			P
7440-39-3	Barium	98.6			P
7440-41-7	Beryllium	0.79			P
7440-43-9	Cadmium	0.07	U		P
7440-70-2	Calcium	4560			P
7440-47-3	Chromium	16.6			P
7440-48-4	Cobalt	6.1			P
7440-50-8	Copper	23.1	E		P
7439-89-6	Iron	26600			P
7439-92-1	Lead	43.6			P
7439-95-4	Magnesium	2180			P
7439-96-5	Manganese	405	N		P
7439-97-6	Mercury	0.38	N		CV
7440-02-0	Nickel	13.0			P
7440-09-7	Potassium	1400			P
7782-49-2	Selenium	0.48	U	N	P
7440-22-4	Silver	0.68	B		P
7440-23-5	Sodium	184	B		P
7440-28-0	Thallium	3.8			P
7440-62-2	Vanadium	25.1			P
7440-66-6	Zinc	72.7			P

Color Before: BROWN Clarity Before: \_\_\_\_\_ Texture: MEDIUMColor After: YELLOW Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_Comments:  
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## SW846 - METALS

-1-

## INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

SS18E-000.5

Lab Name: COMPUCHEM

Contract: \_\_\_\_\_

Lab Code: LIBRTY

Case No.: \_\_\_\_\_

SAS No.: \_\_\_\_\_

SDG No.: 14410Matrix (soil/water): SOILLab Sample ID: 1441002Level (low/med): LOWDate Received: 12/6/2007% Solids: 73.8Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	12400			P
7440-36-0	Antimony	0.62	B	N	P
7440-38-2	Arsenic	4.1			P
7440-39-3	Barium	66.4			P
7440-41-7	Beryllium	0.70			P
7440-43-9	Cadmium	0.07	U		P
7440-70-2	Calcium	1710			P
7440-47-3	Chromium	18.9			P
7440-48-4	Cobalt	7.8			P
7440-50-8	Copper	227	E		P
7439-89-6	Iron	20600			P
7439-92-1	Lead	29.1			P
7439-95-4	Magnesium	1920			P
7439-96-5	Manganese	320	N		P
7439-97-6	Mercury	0.056	N		CV
7440-02-0	Nickel	11.6			P
7440-09-7	Potassium	1130			P
7782-49-2	Selenium	0.45	U	N	P
7440-22-4	Silver	0.07	U		P
7440-23-5	Sodium	122	B		P
7440-28-0	Thallium	3.3			P
7440-62-2	Vanadium	30.6			P
7440-66-6	Zinc	45.3			P

Color Before: BROWN Clarity Before: \_\_\_\_\_ Texture: MEDIUMColor After: YELLOW Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_

Comments:

## SW846 - METALS

-1-

## INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

SS19E-000.5

Lab Name: COMPUCHEM

Contract: \_\_\_\_\_

Lab Code: LIBRTY

Case No.: \_\_\_\_\_

SAS No.: \_\_\_\_\_

SDG No.: 14410Matrix (soil/water): SOILLab Sample ID: 1441013Level (low/med): LOWDate Received: 12/6/2007% Solids: 83.0Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	9890			P
7440-36-0	Antimony	0.77	B	N	P
7440-38-2	Arsenic	3.0			P
7440-39-3	Barium	77.9			P
7440-41-7	Beryllium	0.77			P
7440-43-9	Cadmium	0.06	U		P
7440-70-2	Calcium	1850			P
7440-47-3	Chromium	13.3			P
7440-48-4	Cobalt	6.2			P
7440-50-8	Copper	12.5	E		P
7439-89-6	Iron	13800			P
7439-92-1	Lead	27.5			P
7439-95-4	Magnesium	1510			P
7439-96-5	Manganese	430	N		P
7439-97-6	Mercury	0.054	N		CV
7440-02-0	Nickel	10.0			P
7440-09-7	Potassium	1230			P
7782-49-2	Selenium	0.40	U	N	P
7440-22-4	Silver	0.06	U		P
7440-23-5	Sodium	99.6	B		P
7440-28-0	Thallium	1.8			P
7440-62-2	Vanadium	21.0			P
7440-66-6	Zinc	43.1			P

Color Before: BROWN Clarity Before: \_\_\_\_\_ Texture: MEDIUMColor After: YELLOW Clarity After: \_\_\_\_\_ Artifacts: \_\_\_\_\_Comments:  
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## **APPENDIX C**

### **Support Documentation**

**CompuChem**

**a Division of Liberty Analytical Corp.**

501 Madison Avenue  
Cary, NC 27513

**SDG NARRATIVE**  
**SDG # 14410**

The indicated Sample Delivery Group (SDG) consisting of twenty (20) solid samples were received into the laboratory information management system (LIMS) on December 6 and 7, 2007 intact and in good condition with Chain of Custody (COC) Records in order, unless otherwise noted in any attachments or Quality Assurance Notices. The temperature of the samples upon receipt was 2.1 to 2.4°C. Sample ID's reported in this data package are noted by the receiving department on the COC if they differ from those listed by the samplers on the COC.

The samples were analyzed in accordance with SW846 methodology for the requested TAL metals and mercury.

**INSTRUMENTAL QUALITY CONTROL:**

All calibration verification solutions (ICV & CCV), blanks (ICB & CCB), and interference check samples (ICSA & ICSAB) associated with this data were confirmed to be within allowable limits.

**SAMPLE PREPARATION QUALITY CONTROL:**

The sample preparation procedure verification (PBS & LCSS) was found to be within acceptable ranges and the field samples were prepared and analyzed within the specified holding times.

**MATRIX RELATED QUALITY CONTROL:**

The sample matrix spikes, CCN = 1441019 ID SS06E-000.5S and SS06E-000.5SD were outside control limits for the requested analytes except antimony, manganese, selenium, and mercury.

Control limits for matrix spikes recoveries are set at 75% to 125% of the analyte quantity added unless original sample concentrations exceed the true values of these "spikes" by a factor of four or more. In this case, affected analytes are not flagged even if recoveries are outside percentage recovery control limits.

The sample matrix duplicate, CCN = 1441019 ID SS06E-000.5D was inside control limits for the requested analytes.

CLP control limits for duplicate determinations are +/- 20% Relative Percent Difference (RPD) for concentrations greater than or equal to five times the CRDL in both the original and duplicate samples, and +/- the CRDL for concentrations less than five times the CRDL. The RPD is not calculated if both the original and duplicate values fall below the IDL.

A five-fold serial dilution of sample, CCN = 1441019 ID SS06E-000.5L was performed in accordance with requirements for ICP analysis.

The adjusted sample concentrations were inside control limits for the requested analytes except copper.

Control limits for serial dilution are defined as a deviation less than or equal to 10% in the dilution adjusted concentrations from the original values for all analyte concentrations greater than fifty (50) times their respective Instrument Detection Limit (IDL) in the original sample.

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Page 1 of 2

**CompuChem**  
a division of Liberty Analytical Corp.

**CHAIN OF CUSTODY**

501 Madison Ave.

Cary, NC 27513

Phone: 919-379-4100 Fax 919-379-4040

Courier	FED EX
Airbill No.	863130420884
Sampling Complete? Y or N	Y

Matrices

GW - Ground water  
 WW - Waste water  
 SW - Surface water  
 SO - Soil/Sediment  
 TB - Trip Blank  
 RI - Rinsate  
 WP - Wipe  
 O - Other

pH / Sample Info  
(Lab Use)

Client/Reporting Information		Project Information								Requested Analysis (include method and bottle type)								Matrices
Company Name	Project Name	Sampling Location								Turnaround time								
Tetra Tech NUS	SSA12 soil investigation	SSA12																
Address																		
City State Zip	Kings of Prussia PA 19406																	
Project Contact	Russ Turner	Batch QC or Project Specific? If Specific, which Sample ID?																
Phone #	610-382-1534	Are aqueous samples field filtered for metals? Y or N																
Sampler's Name	Donald Whalen	Are high concentrations expected? Y or N If yes, which ID(s)?																
CompuChem No (Lab Use)	Field ID	Collection		# of bottles	Number of Preserved Bottles						Comments							
		Date	Time		Matrix	HCl	NaOH	HNO3	H2SO4	MEOH		Other						
1441001	SSA12-SS12E-000.5	12/5/07	1000	SO	5													
1441002	SSA12-SS12E-000.5	1025			5													
1441003	SSA12-SS12E-000.5	1040			5													
1441004	SSA12-SS10D-000.5	1130			5													
1441005	SSA12-SB10D-2.02.5	1205			5													
1441006	SSA12-SS08D-000.5	1230			5													
1441007	SSA12-SB07D-2.02.5	1300			5													
14410078	SSA12-SS07D-000.5	1340			5													
14410089	SSA12-SB07D-2.02.5	1405			5													
144100910	SSA12-SS04D-000.5	1435	↓	5														
Lab Use Only																		
Sample Unpacked By:		Cyanide samples checked for sulfide & chlorine? Y or N																
Sample Order Entry By:		625 & Phenol samples checked for chlorine? Y or N																
Samples Received in Good Condition? Y or N		608 samples checked for pH between 5.0-9.0? Y or N																
If no, explain:																		
Sample Custody																		
Relinquished by:	Donald Whalen		Date/Time: 12/5/07 1930		Received by:		Mtg		Date/Time: 12-6-07 9:20									
Relinquished by:			Date/Time:		Received by:				Date/Time:									
Subcontract? Y or N If yes, where?				Custody Seal(s) intact? Y or N		On Ice? Y or N		Cooler Temp: 2.4 °C										

Samples stored 60 days after date report mailed at no extra charge.

White &amp; Yellow copy to lab • Pink copy for customer

16996

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## **CHAIN OF CUSTODY**

501 Madison Ave.

Cary, NC 27513

Phone: 919-379-4100 Fax 919-379-4040

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## CHAIN OF CUSTODY

501 Madison Ave.

Cary, NC 27513

Phone: 919-379-4100 Fax 919-379-4040

Courier	Fed EX
Airbill No.	863130420824
Sampling Complete? Y or N	

Client/Reporting Information			Project Information			Requested Analysis (include method and bottle type)								Matrices			
Company Name Tetra Tech NUS	Project Name SSA 12 soil Investigation					TCL VOC (sw846) 5g Encr	TCL VOC/PCB (sw846) PCB	TAL metals (sw846) 2 oz Jar	40 ml vial	TCL SVOC	TCL PEST	TCL PCB	TAL Lamer	Social Poly	GW - Ground water WW - Waste water SW - Surface water SO - Soil/Sediment TB - Trip Blank RI - Rinsate WP - Wipe O - Other		
Address 234 Mall Blvd Ste. 260	Sampling Location SSA 12															pH / Sample Info (Lab Use) cont'd	
City State Zip King of Prussia, PA 19406	Turnaround time																
Project Contact Russ Turner	Batch QC or Project Specific? If Specific, which Sample ID?																
Phone # 610 382 1534	Are aqueous samples field filtered for metals? Y or N																
Sampler's Name Donald Whalen	Are high concentrations expected? Y or N If yes, which ID(s)?																
CompuChem No (Lab Use)	Field ID	Collection		# of bottles	Number of Preserved Bottles						TCL SVOC	TCL PEST	TCL PCB	TAL Lamer	Social Poly	GW - Ground water WW - Waste water SW - Surface water SO - Soil/Sediment TB - Trip Blank RI - Rinsate WP - Wipe O - Other	
		Date	Time		HCl	NaOH	HNO3	H2SO4	MEOH	Other							
1441011	SSA12-5503D-000.5	12/5/07	1450	SO	5						3	1	-				
1441012	SSA12-SB04D-2.01.5		1500		5						3	1	1				
1441013	SSA12-5519E-000.5		1605		5						3	1	1				
1441014	SSA12-SB03D-1.52.0		1620		5						3	1	1				
1441015	SSA12-FD-01		0000	✓	5						3	1	1				
1441101	RB-020507		1730	RF	10	3	1				3	2	2	2	1	cont'd	
1441102	TB-120507	✓	0710	TB	2	2					2						
Lab Use Only										Comments							
Sample Unpacked By: M. Zimmerman	Cyanide samples checked for sulfide & chlorine? Y or N																
Sample Order Entry By: M. Zimmerman	625 & Phenol samples checked for chlorine? Y or N																
Samples Received in Good Condition? Y or N	608 samples checked for pH between 5.0-9.0? Y or N																
If no, explain:																	
Sample Custody																	
Relinquished by: Donald Whalen	Date/Time: 12/5/07 1930			Received by: M. Zimmerman			Date/Time: 12/6/07 9:20										
Relinquished by:	Date/Time:			Received by:			Date/Time:										
Subcontact? Y or N If yes, where?				Custody Seal(s) intact? Y or N			On Ice? Y or N			Cooler Temp: 2.4 °C							

Samples stored 60 days after date report mailed at no extra charge.

White &amp; Yellow copy to lab • Pink copy for customer

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**CHAIN OF CUSTODY**501 Madison Ave.  
Cary, NC 27513

Phone: 919-379-4100 Fax 919-379-4040

Page 1 of 2

Courier	<u>Fed EX</u>
Airbill No.	<u>863130420895</u>
Sampling Complete? Y or N	<u>N</u>

Client/Reporting Information		Project Information		Requested Analysis (include method and bottle type)						Matrices			
Company Name <u>Tetra Tech NVS</u>	Project Name <u>SSA 12 Soil Invest.</u>	Sampling Location <u>SSA 12</u>	Turnaround time							GW - Ground water WW - Waste water SW - Surface water SO - Soil/Sediment TB - Trip Blank RI - Rinsate WP - Wipe O - Other			
Address <u>234 Mall Blvd. Ste. 260</u>	City <u>Kings of Princeton</u> State <u>PA</u> Zip <u>19406</u>	Project Contact <u>Russ Turner</u>	Phone # <u>610-382-1534</u>	Batch QC or Project Specific? If Specific, which Sample ID?						Are aqueous samples field filtered for metals? Y or N			
Sampler's Name <u>Donald Whalen</u>	Are high concentrations expected? Y or N? If yes, which ID(s)?										pH / Sample Info (Lab Use)		
CompuChem No (Lab Use)	Field ID	Collection		# of bottles	Number of Preserved Bottles					TCL VOC (sw 846) 5 g Encord	TCL SVOC, PCB (sw 846) Ec2	TAL metals (sw 846) R02 Jar	
		Date	Time		HCl	NaOH	HNO3	H2SO4	MEOH				Other
1441016	SSA12-SS02E-000.5	12/6/07	0930	SO	5						2	1	-
1441017	SSA12-SS01E-000.5		0930	SO	5						3	1	1
1441018	SSA12-SS03E-000.5		1005	SO	5						3	1	1
1441019	SSA12-SS06E-000.5		1021	SO	15						9	3	3
1441020	SSA12-SS05E-000.5		1115	SO	5						3	1	1
1441301	SSA12-SS04E-000.5		1140	SO	5						3	1	1
1441302	SSA12-SS07E-000.5		1158	SO	5						3	1	1
1441303	SSA12-SS08E-000.5		1215	SO	5						3	1	1
1441304	SSA12-SS09E-000.5		1240	SO	5						3	1	1
1441305	SSA12-SS15E-000.5	✓	1450	SO	5						3	1	1
Lab Use Only										Comments			
Sample Unpacked By:	Cyanide samples checked for sulfide & chlorine? Y or N									SSA12-SS06E-000.5 = MSD/MSD			
Sample Order Entry By:	625 & Phenol samples checked for chlorine? Y or N												
Samples Received in Good Condition? Y or N	608 samples checked for pH between 5.0-9.0? Y or N												
If no, explain:													
Sample Custody													
Relinquished by: <u>Donald Whalen</u>	Date/Time: 12/6/07 1900			Received by: <u>test</u>			Date/Time: 12/7/07 1000						
Relinquished by:	Date/Time:			Received by:			Date/Time:						
Subcontact? Y or N If yes, where?	Custody Seal(s) intact? Y or N			On Ice? Y or N			Cooler Temp: 2.3 °C						
Samples stored 60 days after date report mailed at no extra charge.													
White & Yellow copy to lab • Pink copy for customer													

## SW846 - METALS

3

## BLANKS

Lab Name: COMPUCHEM Contract: \_\_\_\_\_Lab Code: LIBRTY Case No.: \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 14410Preparation Blank Matrix (soil/water): SOILPreparation Blank Concentration Units (ug/L or mg/kg): MG/KG

Analyte	Initial Calib. Blank (ug/L)	Continuing Calibration Blank (ug/L)						Preparation Blank	
		C	1	C	2	C	3	C	M
Aluminum	14.7 U		14.7 U		17.5 B		28.3 B		P
Antimony	2.9 U		2.9 U		2.9 U		2.9 U	( 0.613 ) B	P
Arsenic	3.2 U		3.2 U		3.2 U		3.2 U	0.320 U	P
Barium	-0.9 B		-0.9 B		-0.8 B		-0.7 B	-0.017 B	P
Beryllium	0.2 U		0.2 U		0.2 U		0.3 B	0.027 B	P
Cadmium	0.5 U		0.5 U		0.5 U		0.5 U	0.050 U	P
Calcium	12.9 B		11.1 B		32.0 B		35.7 B	( 23.187 ) B	P
Chromium	0.5 U		0.5 U		0.5 U		0.5 U	( 0.255 ) B	P
Cobalt	1.6 U		1.6 U		1.6 U		1.6 U	0.160 U	P
Copper	0.9 U		0.9 U		0.9 U		0.9 U	0.090 U	P
Iron	9.8 U		9.8 U		15.7 B		16.6 B	( 2.945 ) B	P
Lead	2.1 U		2.1 U		2.1 U		2.1 U	0.210 U	P
Magnesium	6.5 B		4.1 U		27.8 B		32.2 B	( 4.613 ) B	P
Manganese	-0.5 B		-0.7 B		-0.5 B		-0.4 B	0.010 U	P
Mercury	0.100 U		0.100 U		0.100 U		0.100 U	0.017 U	CV
Nickel	1.1 U		1.1 U		1.1 U		1.1 U	0.110 U	P
Potassium	4.0 U		4.0 U		4.0 U		6.5 B	( 3.311 ) B	P
Selenium	4.3 B		3.3 U		3.3 U		3.3 U	0.330 U	P
Silver	0.5 U		0.5 U		-1.0 B		-0.8 B	0.050 U	P
Sodium	121.5 U		121.5 U		121.5 U		121.5 U	( 51.690 ) B	P
Thallium	4.0 U		4.0 U		4.0 U		4.0 U	0.400 U	P
Vanadium	0.4 U		0.4 U		0.4 U		0.4 U	0.040 U	P
Zinc	0.7 U		0.7 U		0.7 U		0.7 U	( 0.905 ) B	P

## SW846 - METALS

3

## BLANKS

Lab Name: COMPUCHEM Contract: \_\_\_\_\_  
 Lab Code: LIBRTY Case No.: \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 14410  
 Preparation Blank Matrix (soil/water): WATER  
 Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	Continuing Calibration Blank (ug/L)						Preparation Blank	C	M
		C	1 C	2	C	3	C			
Aluminum			57.6 B	20.3 B		31.1 B				P
Antimony			2.9 U	2.9 U		2.9 U				P
Arsenic			3.2 U	3.2 U		3.2 U				P
Barium			-0.7 B	-1.0 B		-0.9 B				P
Beryllium			0.5 B	0.2 B		0.4 B				P
Cadmium			0.5 U	0.5 U		0.5 U				P
Calcium			49.4 B	5.9 U		7.4 B				P
Chromium			0.5 B	0.5 U		0.5 U				P
Cobalt			1.6 U	1.6 U		1.6 U				P
Copper			-1.1 B	-1.6 B		-1.8 B				P
Iron			17.8 B	9.8 U		9.8 U				P
Lead			2.1 U	2.1 U		2.1 U				P
Magnesium			40.3 B	6.7 B		10.0 B				P
Manganese			-0.3 B	-0.6 B		-0.6 B				P
Mercury			0.100 U	0.100 U		0.100 U				CV
Nickel			1.1 U	1.1 U		1.1 U				P
Potassium			4.0 U	4.0 U		4.0 U				P
Selenium			3.3 U	3.3 U		3.3 U				P
Silver			0.5 U	0.5 U		0.5 U				P
Sodium			121.5 U	121.5 U		121.5 U				P
Thallium			4.0 U	4.0 U		4.0 U				P
Vanadium			0.4 U	0.4 U		0.4 U				P
Zinc			2.1 B	0.7 U		0.7 U				P

## SW846 - METALS

3

## BLANKS

Lab Name: COMPUCHEM Contract: \_\_\_\_\_Lab Code: LIBRTY Case No.: \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 14410Preparation Blank Matrix (soil/water): WATERPreparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	Continuing Calibration Blank (ug/L)						Preparation Blank	C	M
		C	1	C	2	C	3			
Aluminum			30.3   B		42.9   B		47.5   B			P
Antimony			2.9   U		2.9   U		2.9   U			P
Arsenic			3.2   U		3.2   U		3.2   U			P
Barium			-0.7   B		-0.6   B		-0.7   B			P
Beryllium			0.3   B		0.4   B		0.4   B			P
Cadmium			0.5   U		0.6   B		0.5   B			P
Calcium			35.0   B		40.4   B		44.5   B			P
Chromium			0.5   U		0.5   B		0.5   U			P
Cobalt			1.6   U		1.6   U		1.6   B			P
Copper			0.9   U		0.9   U		0.9   U			P
Iron			16.3   B		23.7   B		25.8   B			P
Lead			2.1   U		2.1   U		2.1   U			P
Magnesium			28.6   B		35.7   B		40.7   B			P
Manganese			-0.4   B		-0.3   B		-0.3   B			P
Mercury			0.100   U		0.100   U		0.100   U			CV
Nickel			1.1   U		1.1   U		1.1   U			P
Potassium			4.0   B		8.5   B		6.7   B			P
Selenium			3.3   U		3.3   U		3.3   U			P
Silver			0.5   U		0.5   U		0.5   U			P
Sodium			121.5   U		121.5   U		121.5   U			P
Thallium			4.0   U		4.0   U		4.0   U			P
Vanadium			0.4   U		0.4   U		0.5   B			P
Zinc			0.7   U		0.7   U		0.7   U			P

## SW846 - METALS

3

## BLANKS

Lab Name: COMPUCHEM Contract: \_\_\_\_\_Lab Code: LIBRTY Case No.: \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 14410Preparation Blank Matrix (soil/water): WATERPreparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	Continuing Calibration Blank (ug/L)						Preparation Blank	C	M
		C	1	C	2	C	3			
Aluminum			55.3	B	29.2	B	29.6	B		P
Antimony			2.9	U	2.9	U	2.9	U		P
Arsenic			3.2	U	3.2	U	3.2	U		P
Barium			-0.5	B	-0.9	B	-0.8	B		P
Beryllium			0.5	B	0.2	B	0.3	B		P
Cadmium			0.5	U	0.5	U	0.5	U		P
Calcium			51.6	B	22.4	B	34.4	B		P
Chromium			0.6	B	0.5	U	0.5	U		P
Cobalt			1.6	U	1.6	U	1.6	U		P
Copper			0.9	U	-1.2	B	-1.2	B		P
Iron			19.5	B	9.8	U	17.6	B		P
Lead			2.1	U	2.1	U	2.1	U		P
Magnesium			46.0	B	19.3	B	22.6	B		P
Manganese			-0.2	B	-0.5	B	-0.5	B		P
Mercury			0.100	U	0.100	U	0.100	U		CV
Nickel			1.1	U	1.1	U	1.1	U		P
Potassium			8.7	B	4.0	U	4.5	B		P
Selenium			3.3	U	3.3	U	3.3	U		P
Silver			0.5	U	0.5	U	0.5	U		P
Sodium			121.5	U	121.5	U	121.5	U		P
Thallium			4.0	U	4.0	U	4.0	U		P
Vanadium			0.4	B	0.4	U	0.4	U		P
Zinc			0.7	U	0.7	U	1.9	B		P

## SW846 - METALS

3

## BLANKS

Lab Name: COMPUCHEM Contract: \_\_\_\_\_Lab Code: LIBRTY Case No.: \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 14410Preparation Blank Matrix (soil/water): WATERPreparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	Continuing Calibration Blank (ug/L)						Preparation Blank	C	M
		C	1	C	2	C	3			
Aluminum			39.4	B						P
Antimony			2.9	U						P
Arsenic			3.2	U						P
Barium			-0.8	B						P
Beryllium			0.5	B						P
Cadmium			0.5	U						P
Calcium			13.2	B						P
Chromium			0.5	U						P
Cobalt			1.6	U						P
Copper			-1.8	B						P
Iron			14.5	B						P
Lead			2.1	U						P
Magnesium			16.9	B						P
Manganese			-0.3	B						P
Mercury			0.100	U	0.100	U	0.100	U		CV
Nickel			1.1	U						P
Potassium			4.8	B						P
Selenium			(4.8	B)						P
Silver			0.5	U						P
Sodium			121.5	U						P
Thallium			4.0	U						P
Vanadium			0.4	U						P
Zinc			0.7	U						P

## SW846 - METALS

4

## ICP INTERFERENCE CHECK SAMPLE

Lab Name: COMPUCHEM Contract: \_\_\_\_\_  
 Lab Code: LIBERTY Case No.: \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 14410  
 ICP ID Number: P4 ICS Source: EPA-503-203  
 Concentration Units: ug/L

Analyte	True		Initial Found			Final Found		
	Sol.A	Sol.AB	Sol.A	Sol.AB	%R	Sol.A	Sol.AB	%R
Aluminum	244100	241100	251000	251000	104.1			
Antimony	0	589	0.82	621	105.4			
Arsenic	0	101	2.2	103	102.0			
Barium	2	495	1.6	509	102.8			
Beryllium	0	475	0.64	504	106.1			
Cadmium	0	940	-0.46	945	100.5			
Calcium	234900	231100	255000	255000	110.3			
Chromium	43	511	43.5	524	102.5			
Cobalt	4	461	6.1	490	106.3			
Copper	23	548	23.4	526	96.0			
Iron	95600	94800	96900	97000	102.3			
Lead	10	61	9.1	56.2	92.1			
Magnesium	247500	251100	266000	265000	105.5			
Manganese	19	502	20.2	526	104.8			
Nickel	21	984	20.8	983	99.9			
Potassium	0	0	1.4	2.1				
Selenium	0	53	0.74	50.6	95.5			
Silver	0	206	-0.70	203	98.5			
Sodium	0	0	825	864				
Thallium	0	103	12.1	109	105.8			
Vanadium	1	494	0.22	499	101.0			
Zinc	28	1028	13.7	950	92.4			

## SW846 - METALS

4

## ICP INTERFERENCE CHECK SAMPLE

Lab Name: COMPUCHEM Contract: \_\_\_\_\_Lab Code: LIBERTY Case No.: \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 14410ICP ID Number: P4 ICS Source: EPA-503-203Concentration Units: ug/L

Analyte	True		Initial Found			Final Found		
	Sol.A	Sol.AB	Sol.A	Sol.AB	%R	Sol.A	Sol.AB	%R
Aluminum	244100	241100	252000	252000	104.5			
Antimony	0	589	(3.4)	623	105.8			
Arsenic	0	101	-0.77	101	100.0			
Barium	2	495	1.6	517	104.4			
Beryllium	0	475	0.38	509	107.2			
Cadmium	0	940	(-2.7)	934	99.4			
Calcium	234900	231100	250000	252000	109.0			
Chromium	43	511	42.6	513	100.4			
Cobalt	4	461	3.1	484	105.0			
Copper	23	548	23.9	536	97.8			
Iron	95600	94800	96000	96800	102.1			
Lead	10	61	7.2	55.1	90.3			
Magnesium	247500	251100	261000	261000	103.9			
Manganese	19	502	19.4	517	103.0			
Nickel	21	984	20.7	975	99.1			
Potassium	0	0	-0.76	-1.6				
Selenium	0	53	3.1	50.1	94.5			
Silver	0	206	0.023	207	100.5			
Sodium	0	0	(789)	858				
Thallium	0	103	(11.3)	107	103.9			
Vanadium	1	494	-0.20	499	101.0			
Zinc	28	1028	12.7	932	90.7			

## INORGANIC INTERFERENCE CHECK SAMPLE VALIDATION

Affected Analyte	MDL	Sample	Reported Result	Qualifier	Interferent	Interferent level in ICS	Conc. ICS	Interferent Level	Est. Interference	Validation Action	Validation Action
Antimony	2.9	SS08D-2.02.5	81.17		Iron	95600	3.4	323058	11.49	K	na
Beryllium	0.2	SS08D-2.02.5	3.834		Iron	95600	0.64	323058	2.16	K	na
Cadmium	0.5	SS08D-2.02.5	122.3		Iron	95600	-2.7	323058	-9.12	na	na
Cobalt	1.6	SS08D-2.02.5	85.74		Iron	95600	6.1	323058	20.61	K	na
Silver	0.5	SS08D-2.02.5	54.19		Iron	95600	-0.7	323058	-2.37	na	na
Sodium	121.5	SS08D-2.02.5	1515		Iron	95600	789	323058	2666.24	R	na
Thallium	4	SS08D-2.02.5	319.8		Iron	95600	12.1	323058	40.89	K	na

Affected Analyte	MDL	Sample	Reported Result	Qualifier	Interferent	Interferent level in ICS	Conc. ICS	Interferent Level	Est. Interference	Validation Action	Validation Action
Antimony	2.9	SS07D-000.5	5.43		Iron	95600	3.4	80315	2.86	K	na
Beryllium	0.2	SS07D-000.5	4.4		Iron	95600	0.64	80315	0.54	K	na
Cadmium	0.5	SS07D-000.5		U	Iron	95600	-2.7	80315	-2.27	na	UR
Cobalt	1.6	SS07D-000.5	26.16		Iron	95600	6.1	80315	5.12	K	na
Silver	0.5	SS07D-000.5	0.627		Iron	95600	-0.7	80315	-0.59	L	na
Sodium	121.5	SS07D-000.5	729		Iron	95600	789	80315	662.85	K	na
Thallium	4	SS07D-000.5	10.09		Iron	95600	12.1	80315	10.17	R	na

Affected Analyte	MDL	Sample	Reported Result	Qualifier	Interferent	Interferent level in ICS	Conc. ICS	Interferent Level	Est. Interference	Validation Action	Validation Action
Antimony	2.9	SS07D-2.02.5	4.325		Iron	95600	3.4	308737	10.98	R	na
Beryllium	0.2	SS07D-2.02.5	5.816		Iron	95600	0.64	308737	2.07	K	na
Cadmium	0.5	SS07D-2.02.5		U	Iron	95600	-2.7	308737	-8.72	na	UR
Cobalt	1.6	SS07D-2.02.5	42.6		Iron	95600	6.1	308737	19.70	K	na
Silver	0.5	SS07D-2.02.5		U	Iron	95600	-0.7	308737	-2.26	na	UR
Sodium	121.5	SS07D-2.02.5	847.3		Iron	95600	789	308737	2548.05	R	na
Thallium	4	SS07D-2.02.5	51.16		Iron	95600	12.1	308737	39.08	K	na

Affected Analyte	MDL	Sample	Reported Result	Qualifier	Interferent	Interferent level in ICS	Conc. ICS	Interferent Level	Est. Interference	Validation Action	Validation Action
Antimony	2.9	SS04D-000.5	9.696		Iron	95600	3.4	157594	5.60	K	na
Beryllium	0.2	SS04D-000.5	6.123		Iron	95600	0.64	157594	1.06	K	na
Cadmium	0.5	SS04D-000.5	67		Iron	95600	-2.7	157594	-4.45	na	na
Cobalt	1.6	SS04D-000.5	63.7		Iron	95600	6.1	157594	10.06	K	na
Silver	0.5	SS04D-000.5	3.167		Iron	95600	-0.7	157594	-1.15	L	na
Sodium	121.5	SS04D-000.5	845		Iron	95600	789	157594	1300.65	R	na
Thallium	4	SS04D-000.5	26.81		Iron	95600	12.1	157594	19.95	K	na

Affected Analyte	MDL	Sample	Reported Result	Qualifier	Interferent	Interferent level in ICS	Conc. ICS	Interferent Level	Est. Interference	Validation Action	Validation Action
Antimony	2.9	SS03D-000.5	7.8		Iron	95600	3.4	154557	5.50	K	na
Beryllium	0.2	SS03D-000.5	5.913		Iron	95600	0.64	154557	1.03	K	na
Cadmium	0.5	SS03D-000.5	37.63		Iron	95600	-2.7	154557	-4.37	L	na
Cobalt	1.6	SS03D-000.5	56.293		Iron	95600	6.1	154557	9.86	K	na
Silver	0.5	SS03D-000.5	0.871		Iron	95600	-0.7	154557	-1.13	L	na
Sodium	121.5	SS03D-000.5	703.5		Iron	95600	789	154557	1275.58	R	na
Thallium	4	SS03D-000.5	22.94		Iron	95600	12.1	154557	19.56	K	na

Affected Analyte	MDL	Sample	Reported Result	Qualifier	Interferent	Interferent level in ICS	Conc. ICS	Interferent Level	Est. Interference	Validation Action	Validation Action
Antimony	2.9	SS04D-2.02.5	3.97		Iron	95600	3.4	202592	7.21	R	na
Beryllium	0.2	SS04D-2.02.5	5.9		Iron	95600	0.64	202592	1.36	K	na
Cadmium	0.5	SS04D-2.02.5		U	Iron	95600	-2.7	202592	-5.72	na	UR
Cobalt	1.6	SS04D-2.02.5	91.9		Iron	95600	6.1	202592	12.93	K	na
Silver	0.5	SS04D-2.02.5		U	Iron	95600	-0.7	202592	-1.48	na	UR
Sodium	121.5	SS04D-2.02.5	1053		Iron	95600	789	202592	1672.02	R	na
Thallium	4	SS04D-2.02.5	31.75		Iron	95600	12.1	202592	25.64	K	na

Affected Analyte	MDL	Sample	Reported Result	Qualifier	Interferent	Interferent level in ICS	Conc. ICS	Interferent Level	Est. Interference	Validation Action	Validation Action
Antimony	2.9	SS19E-000.5	6.406		Iron	95600	3.4	114891	4.09	K	na
Beryllium	0.2	SS19E-000.5	6.415		Iron	95600	0.64	114891	0.77	K	na
Cadmium	0.5	SS19E-000.5		U	Iron	95600	-2.7	114891	-3.24	na	UR
Cobalt	1.6	SS19E-000.5	51.31		Iron	95600	6.1	114891	7.33	K	na
Silver	0.5	SS19E-000.5		U	Iron	95600	-0.7	114891	-0.84	na	UR
Sodium	121.5	SS19E-000.5	826		Iron	95600	789	114891	948.21	R	na
Thallium	4	SS19E-000.5	15.16		Iron	95600	12.1	114891	14.54	K	na

## INORGANIC INTERFERENCE CHECK SAMPLE VALIDATION

(B)

Affected Analyte	MDL	Sample	Reported Result	Qualifier	Interferent	Interferent level in ICS	Conc. ICS	Interferent Level	Est. Interference	Validation Action	Validation Action
Antimony	2.9	SS06E-000.5	7.076		Iron	95600	3.4	168693	6.00	K	na
Beryllium	0.2	SS06E-000.5	5.723		Iron	95600	0.64	168693	1.13	K	na
Cadmium	0.5	SS06E-000.5		U	Iron	95600	-2.7	168693	-4.76	na	UR
Cobalt	1.6	SS06E-000.5	42.674		Iron	95600	6.1	168693	10.76	K	na
Silver	0.5	SS06E-000.5		U	Iron	95600	-0.7	168693	-1.24	na	UR
Sodium	121.5	SS06E-000.5	1754		Iron	95600	789	168693	1392.25	K	na
Thallium	4	SS06E-000.5	27.803		Iron	95600	12.1	168693	21.35	K	na

(B)

Affected Analyte	MDL	Sample	Reported Result	Qualifier	Interferent	Interferent level in ICS	Conc. ICS	Interferent Level	Est. Interference	Validation Action	Validation Action
Antimony	2.9	SS17E-000.5	7.392		Iron	95600	3.4	181938	6.47	K	na
Beryllium	0.2	SS17E-000.5	5.426		Iron	95600	0.64	181938	1.22	K	na
Cadmium	0.5	SS17E-000.5		U	Iron	95600	-2.7	181938	-5.14	na	UR
Cobalt	1.6	SS17E-000.5	41.81		Iron	95600	6.1	181938	11.61	K	na
Silver	0.5	SS17E-000.5	4.656		Iron	95600	-0.7	181938	-1.33	L	na
Sodium	121.5	SS17E-000.5	1256		Iron	95600	789	181938	1501.56	R	na
Thallium	4	SS17E-000.5	26.112		Iron	95600	12.1	181938	23.03	K	na

(B)

Affected Analyte	MDL	Sample	Reported Result	Qualifier	Interferent	Interferent level in ICS	Conc. ICS	Interferent Level	Est. Interference	Validation Action	Validation Action
Antimony	2.9	SS18E-000.5	4.584		Iron	95600	3.4	152368	5.42	R	na
Beryllium	0.2	SS18E-000.5	5.161		Iron	95600	0.64	152368	1.02	K	na
Cadmium	0.5	SS18E-000.5		U	Iron	95600	-2.7	152368	-4.30	na	UR
Cobalt	1.6	SS18E-000.5	57.552		Iron	95600	6.1	152368	9.72	K	na
Silver	0.5	SS18E-000.5		U	Iron	95600	-0.7	152368	-1.12	na	UR
Sodium	121.5	SS18E-000.5	899		Iron	95600	789	152368	1257.51	R	na
Thallium	4	SS18E-000.5	24.258		Iron	95600	12.1	152368	19.29	K	na

(B)

Affected Analyte	MDL	Sample	Reported Result	Qualifier	Interferent	Interferent level in ICS	Conc. ICS	Interferent Level	Est. Interference	Validation Action	Validation Action
Antimony	2.9	SS16E-000.5	7.32		Iron	95600	3.4	121401	4.32	K	na
Beryllium	0.2	SS16E-000.5	5.239		Iron	95600	0.64	121401	0.81	K	na
Cadmium	0.5	SS16E-000.5	4.448		Iron	95600	-2.7	121401	-3.43	L	na
Cobalt	1.6	SS16E-000.5	40.093		Iron	95600	6.1	121401	7.75	K	na
Silver	0.5	SS16E-000.5	39.162		Iron	95600	-0.7	121401	-0.89	na	na
Sodium	121.5	SS16E-000.5	957.25		Iron	95600	789	121401	1001.94	R	na
Thallium	4	SS16E-000.5	22.665		Iron	95600	12.1	121401	15.37	K	na

(B)

Affected Analyte	MDL	Sample	Reported Result	Qualifier	Interferent	Interferent level in ICS	Conc. ICS	Interferent Level	Est. Interference	Validation Action	Validation Action
Antimony	2.9	SS10D-000.5	8.274		Iron	95600	3.4	104299	3.71	K	na
Beryllium	0.2	SS10D-000.5	6.67		Iron	95600	0.64	104299	0.70	K	na
Cadmium	0.5	SS10D-000.5		U	Iron	95600	-2.7	104299	-2.95	na	UR
Cobalt	1.6	SS10D-000.5	36.299		Iron	95600	6.1	104299	6.66	K	na
Silver	0.5	SS10D-000.5		U	Iron	95600	-0.7	104299	-0.76	na	UR
Sodium	121.5	SS10D-000.5	658.77		Iron	95600	789	104299	860.79	R	na
Thallium	4	SS10D-000.5	15.4		Iron	95600	12.1	104299	13.20	K	na

(B)

Affected Analyte	MDL	Sample	Reported Result	Qualifier	Interferent	Interferent level in ICS	Conc. ICS	Interferent Level	Est. Interference	Validation Action	Validation Action
Antimony	2.9	SS10D-2.02.5		U	Iron	95600	3.4	186625	6.64	na	na
Beryllium	0.2	SS10D-2.02.5	5.392		Iron	95600	0.64	186625	1.25	K	na
Cadmium	0.5	SS10D-2.02.5		U	Iron	95600	-2.7	186625	-5.27	na	UR
Cobalt	1.6	SS10D-2.02.5	39.12		Iron	95600	6.1	186625	11.91	K	na
Silver	0.5	SS10D-2.02.5		U	Iron	95600	-0.7	186625	-1.37	na	UR
Sodium	121.5	SS10D-2.02.5	1098		Iron	95600	789	186625	1540.24	R	na
Thallium	4	SS10D-2.02.5	27.87		Iron	95600	12.1	186625	23.62	K	na

(B)

Affected Analyte	MDL	Sample	Reported Result	Qualifier	Interferent	Interferent level in ICS	Conc. ICS	Interferent Level	Est. Interference	Validation Action	Validation Action
Antimony	2.9	SS08D-000.5	6.64		Iron	95600	3.4	136806	4.87	K	na
Beryllium	0.2	SS08D-000.5	6.44		Iron	95600	0.64	136806	0.92	K	na
Cadmium	0.5	SS08D-000.5	0.6399		Iron	95600	-2.7	136806	-3.86	L	na
Cobalt	1.6	SS08D-000.5	38.72		Iron	95600	6.1	136806	8.73	K	na
Silver	0.5	SS08D-000.5	25.1		Iron	95600	-0.7	136806	-1.00	na	na
Sodium	121.5	SS08D-000.5	894		Iron	95600	789	136806	1129.08	R	na
Thallium	4	SS08D-000.5	25.47		Iron	95600	12.1	136806	17.32	K	na

## INORGANIC INTERFERENCE CHECK SAMPLE VALIDATION

✓ (B) (J)

Affected Analyte	MDL	Sample	Reported Result	Qualifier	Interferent	Interferent level in ICS	Conc. ICS	Interferent Level	Est. Interference	Validation Action	Validation Action
Antimony	2.9	SS03D-1.52.0	5.748		Iron	95600	3.4	158398	5.63	K	na
Beryllium	0.2	SS03D-1.52.0	6.54		Iron	95600	0.64	158398	1.06	K	na
Cadmium	0.5	SS03D-1.52.0	5.48		Iron	95600	-2.7	158398	-4.47	L	na
Cobalt	1.6	SS03D-1.52.0	69.54		Iron	95600	6.1	158398	10.11	K	na
Silver	0.5	SS03D-1.52.0		U	Iron	95600	-0.7	158398	-1.16	na	UR
Sodium	121.5	SS03D-1.52.0	962		Iron	95600	789	158398	1307.28	R	na
Thallium	4	SS03D-1.52.0	26.6		Iron	95600	12.1	158398	20.05	K	na

✓ (B) (J) (B)

Affected Analyte	MDL	Sample	Reported Result	Qualifier	Interferent	Interferent level in ICS	Conc. ICS	Interferent Level	Est. Interference	Validation Action	Validation Action
Antimony	2.9	SSA12-FD-01	4.746		Iron	95600	3.4	112608	4.00	K	na
Beryllium	0.2	SSA12-FD-01	5.532		Iron	95600	0.64	112608	0.75	K	na
Cadmium	0.5	SSA12-FD-01	5.06		Iron	95600	-2.7	112608	-3.18	L	na
Cobalt	1.6	SSA12-FD-01	41.65		Iron	95600	6.1	112608	7.19	K	na
Silver	0.5	SSA12-FD-01	37.91		Iron	95600	-0.7	112608	-0.82	na	na
Sodium	121.5	SSA12-FD-01	934		Iron	95600	789	112608	929.37	K	na
Thallium	4	SSA12-FD-01	18.4		Iron	95600	12.1	112608	14.25	K	na

✓ (B) (J) (B)

Affected Analyte	MDL	Sample	Reported Result	Qualifier	Interferent	Interferent level in ICS	Conc. ICS	Interferent Level	Est. Interference	Validation Action	Validation Action
Antimony	2.9	SS02E-000.5	4.066		Iron	95600	3.4	80767	2.87	K	na
Beryllium	0.2	SS02E-000.5	5.53		Iron	95600	0.64	80767	0.54	na	na
Cadmium	0.5	SS02E-000.5		U	Iron	95600	-2.7	80767	-2.28	na	UR
Cobalt	1.6	SS02E-000.5	30.72		Iron	95600	6.1	80767	5.15	K	na
Silver	0.5	SS02E-000.5		U	Iron	95600	-0.7	80767	-0.59	na	UR
Sodium	121.5	SS02E-000.5	749		Iron	95600	789	80767	666.58	K	na
Thallium	4	SS02E-000.5	12.9		Iron	95600	12.1	80767	10.22	K	na

✓ (B) (J) (B)

Affected Analyte	MDL	Sample	Reported Result	Qualifier	Interferent	Interferent level in ICS	Conc. ICS	Interferent Level	Est. Interference	Validation Action	Validation Action
Antimony	2.9	SS01E-000.5	5.84		Iron	95600	3.4	80523	2.86	K	na
Beryllium	0.2	SS01E-000.5	3.27		Iron	95600	0.64	80523	0.54	K	na
Cadmium	0.5	SS01E-000.5		U	Iron	95600	-2.7	80523	-2.27	na	UR
Cobalt	1.6	SS01E-000.5	34.17		Iron	95600	6.1	80523	5.14	K	na
Silver	0.5	SS01E-000.5		U	Iron	95600	-0.7	80523	-0.59	na	UR
Sodium	121.5	SS01E-000.5	389.9		Iron	95600	789	80523	664.57	R	na
Thallium	4	SS01E-000.5	10.75		Iron	95600	12.1	80523	10.19	K	na

✓ (B) (J) (B)

Affected Analyte	MDL	Sample	Reported Result	Qualifier	Interferent	Interferent level in ICS	Conc. ICS	Interferent Level	Est. Interference	Validation Action	Validation Action
Antimony	2.9	SS03E-000.5	9.185		Iron	95600	3.4	114237	4.06	K	na
Beryllium	0.2	SS03E-000.5	3.394		Iron	95600	0.64	114237	0.76	K	na
Cadmium	0.5	SS03E-000.5		U	Iron	95600	-2.7	114237	-3.23	na	UR
Cobalt	1.6	SS03E-000.5	36.53		Iron	95600	6.1	114237	7.29	K	na
Silver	0.5	SS03E-000.5		U	Iron	95600	-0.7	114237	-0.84	na	UR
Sodium	121.5	SS03E-000.5	761.6		Iron	95600	789	114237	942.81	R	na
Thallium	4	SS03E-000.5	19		Iron	95600	12.1	114237	14.46	K	na

✓ (B) (J) (B)

Affected Analyte	MDL	Sample	Reported Result	Qualifier	Interferent	Interferent level in ICS	Conc. ICS	Interferent Level	Est. Interference	Validation Action	Validation Action
Antimony	2.9	SS05E-000.5	6.29		Iron	95600	3.4	124251	4.42	K	na
Beryllium	0.2	SS05E-000.5	5.386		Iron	95600	0.64	124251	0.83	K	na
Cadmium	0.5	SS05E-000.5	1.368		Iron	95600	-2.7	124251	-3.51	L	na
Cobalt	1.6	SS05E-000.5	39.35		Iron	95600	6.1	124251	7.93	K	na
Silver	0.5	SS05E-000.5		U	Iron	95600	-0.7	124251	-0.91	na	UR
Sodium	121.5	SS05E-000.5	1078		Iron	95600	789	124251	1025.46	K	na
Thallium	4	SS05E-000.5	22.92		Iron	95600	12.1	124251	15.73	K	na

## SW846 - METALS

2B-IN

## CRDL STANDARD FOR AA AND ICP

Lab Name: COMPUCHEM Contract: \_\_\_\_\_Lab Code: LIBRTY Case No.: \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 14410AA CRDL Standard Source: HP617816ICP CRDL Standard Source: HIPUR

Concentration Units: ug/L

Analyte	True	Found	%R	CRDL Standard for ICP			
				Initial True	Final Found	Initial %R	Final %R
Aluminum				200.0	200.77	100.4	
Antimony				60.0	60.01	100.0	
Arsenic				10.0	9.15	91.5	
Barium				200.0	185.81	92.9	
Beryllium				5.0	5.24	104.8	
Cadmium				5.0	5.66	113.2	*
Calcium				2000.0	2119.97	106.0	
Chromium				10.0	9.72	97.2	
Cobalt				50.0	52.53	105.1	
Copper				25.0	22.97	91.9	
Iron				100.0	88.07	88.1	
Lead				3.0	3.03	101.0	
Magnesium				2000.0	2041.48	102.1	
Manganese				15.0	14.57	97.1	
Mercury	0.2	0.21	105.0				
Nickel				40.0	40.60	101.5	
Potassium				2000.0	1692.66	84.6	*
Selenium				5.0	6.86	137.2	
Silver				10.0	8.63	86.3	*
Sodium				2000.0	2026.55	101.3	
Thallium				10.0	7.84	78.4	*
Vanadium				50.0	48.95	97.9	
Zinc				20.0	20.53	102.6	

Control Limits: no limits have been established by EPA at this time

## SW846 - METALS

5A

## SPIKE SAMPLE RECOVERY

SAMPLE NO.

SS06E-000.5S

Lab Name: COMPUCHEM Contract: \_\_\_\_\_Lab Code: LIBRTY Case No.: \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 14410Matrix (soil/water): SOIL Level (low/med): LOW% Solids for Sample: 77.7Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Antimony	75 - 125	30.2034		0.9107	B	64.35	45.5	N	P
Arsenic	75 - 125	9.9400		5.8023		5.15	80.3		P
Barium	75 - 125	288.0719		66.9627		257.40	85.9		P
Beryllium	75 - 125	6.6021		0.7367		6.44	91.1		P
Cadmium	75 - 125	5.4337		0.0644	U	6.44	84.4		P
Chromium	75 - 125	45.7780		23.0586		25.74	88.3		P
Cobalt	75 - 125	63.5891		5.4922		64.35	90.3		P
Copper	75 - 125	47.1562		14.4053		32.18	101.8		P
Lead		37.5703		27.4458		2.57	393.9		P
Manganese	75 - 125	316.5247		224.1160		64.35	143.6	N	P
Mercury	75 - 125	0.3183		0.0428		0.21	131.2	N	CV
Nickel	75 - 125	70.2707		11.7088		64.35	91.0		P
Selenium	75 - 125	0.6681		0.4247	U	1.29	51.8	N	P
Silver	75 - 125	6.0841		0.0644	U	6.44	94.5		P
Thallium	75 - 125	8.6712		3.5783		6.44	79.1		P
Vanadium	75 - 125	92.7429		36.5803		64.35	87.3		P
Zinc	75 - 125	112.8525		51.4144		64.35	95.5		P

Comments:

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## SW846 - METALS

5A

## SPIKE SAMPLE RECOVERY

SAMPLE NO.

SS06E-000.5SD

Lab Name: COMPUCHEM Contract:Lab Code: LIBERTY Case No.:            SAS No.:            SDG No.: 14410Matrix (soil/water): SOIL Level (low/med): LOW% Solids for Sample: 77.7Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Antimony	75 - 125	29.3562		0.9107	B	64.35	44.2	N	P
Arsenic	75 - 125	10.1635		5.8023		5.15	84.7		P
Barium	75 - 125	290.6502		66.9627		257.40	86.9		P
Beryllium	75 - 125	6.6114		0.7367		6.44	91.2		P
Cadmium	75 - 125	5.9228		0.0644	U	6.44	92.0		P
Chromium	75 - 125	47.4849		23.0586		25.74	94.9		P
Cobalt	75 - 125	63.5130		5.4922		64.35	90.2		P
Copper	75 - 125	48.2996		14.4053		32.18	105.3		P
Lead		31.1940		27.4458		2.57	145.8		P
Manganese		330.7994		224.1160		64.35	165.8	N	P
Mercury	75 - 125	0.3093		0.0428		0.21	126.9	N	CV
Nickel	75 - 125	71.1039		11.7088		64.35	92.3		P
Selenium	75 - 125	1.0590		0.4247	U	1.29	82.1		P
Silver	75 - 125	6.0554		0.0644	U	6.44	94.0		P
Thallium	75 - 125	9.3856		3.5783		6.44	90.2		P
Vanadium	75 - 125	95.0021		36.5803		64.35	90.8		P
Zinc	75 - 125	113.7663		51.4144		64.35	96.9		P

Comments:

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## SW846 - METALS

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## LABORATORY CONTROL SAMPLE

Lab Name: COMPUCHEM Contract: \_\_\_\_\_  
 Lab Code: LIBRTY Case No.: \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 14410  
 Solid LCS Source: ERA-540  
 Aqueous LCS Source: \_\_\_\_\_

Analyte	Aqueous (ug/L)			Solid (mg/kg)				%R
	True	Found	%R	True	Found	C	Limits	
Aluminum				7590.0	6759.19	4390.0	10800.0	89.1
Antimony				77.5	57.09	0.1	173.0	73.7
Arsenic				80.9	73.24	64.5	97.3	90.5
Barium				156.0	138.42	128.0	184.0	88.7
Beryllium				143.0	130.80	117.0	169.0	91.5
Cadmium				233.0	210.50	188.0	277.0	90.3
Calcium				4320.0	4006.57	3420.0	5220.0	92.7
Chromium				60.8	54.88	47.7	73.8	90.3
Cobalt				68.6	63.16	56.1	81.1	92.1
Copper				131.0	137.15	108.0	154.0	104.7
Iron				14400.0	11928.94	7420.0	21400.0	82.8
Lead				76.8	67.70	61.9	91.8	88.2
Magnesium				2220.0	1964.97	1710.0	2730.0	88.5
Manganese				304.0	283.58	243.0	365.0	93.3
Mercury				3.6	4.6	2.5	4.8	127.8
Nickel				49.6	47.64	40.4	58.8	96.0
Potassium				2380.0	2253.46	1700.0	3060.0	94.7
Selenium				82.9	68.47	62.6	103.0	82.6
Silver				80.0	81.72	49.0	111.0	102.2
Sodium				456.0	436.65	254.0	658.0	95.8
Thallium				158.0	146.56	119.0	197.0	92.8
Vanadium				72.4	63.93	51.7	93.0	88.3
Zinc				116.0	103.04	90.5	141.0	88.8

## SW846 - METALS

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ICP SERIAL DILUTIONS

SAMPLE NO.

SS06E-000.5L

Lab Name: COMPUCHEM Contract: \_\_\_\_\_

Lab Code: LIBERTY Case No.: \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: 14410

Matrix (soil/water): SOIL Level (low/med): LOW

Concentration Units: ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Aluminum	129605.60		126616.30		2.3		P
Antimony	7.08	B	14.50	U	100.0		P
Arsenic	45.08		45.22	B	0.3		P
Barium	520.30		491.16	B	5.6		P
Beryllium	5.72		5.98	B	4.5		P
Cadmium	0.50	U	2.50	U			P
Calcium	6062.87		5991.57	B	1.2		P
Chromium	179.17		174.76		2.5		P
Cobalt	42.67		37.46		12.2		P
Copper	111.93		97.60		12.8	E	P
Iron	168693.60		167355.70		0.8		P
Lead	213.25		221.63		3.9		P
Magnesium	15931.09		16229.27	B	1.9		P
Manganese	1741.38		1690.01		2.9		P
Mercury	0.21		0.50	U	100.0		CV
Nickel	90.98		92.46	B	1.6		P
Potassium	5178.99		4696.14	B	9.3		P
Selenium	3.30	U	16.50	U			P
Silver	0.50	U	2.50	U			P
Sodium	1754.26	B	1334.79	B	23.9		P
Thallium	27.80		36.26	B	30.4		P
Vanadium	284.23		272.77		4.0		P
Zinc	399.49		410.02		2.6		P